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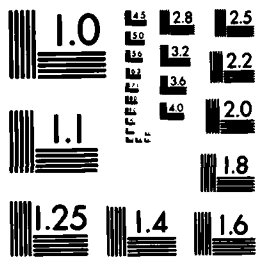

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U.S. NAVY CLIMATIC STUDY
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GULF OF MEXICO
VOLUME 2

WEST CARIBBEAN SEA

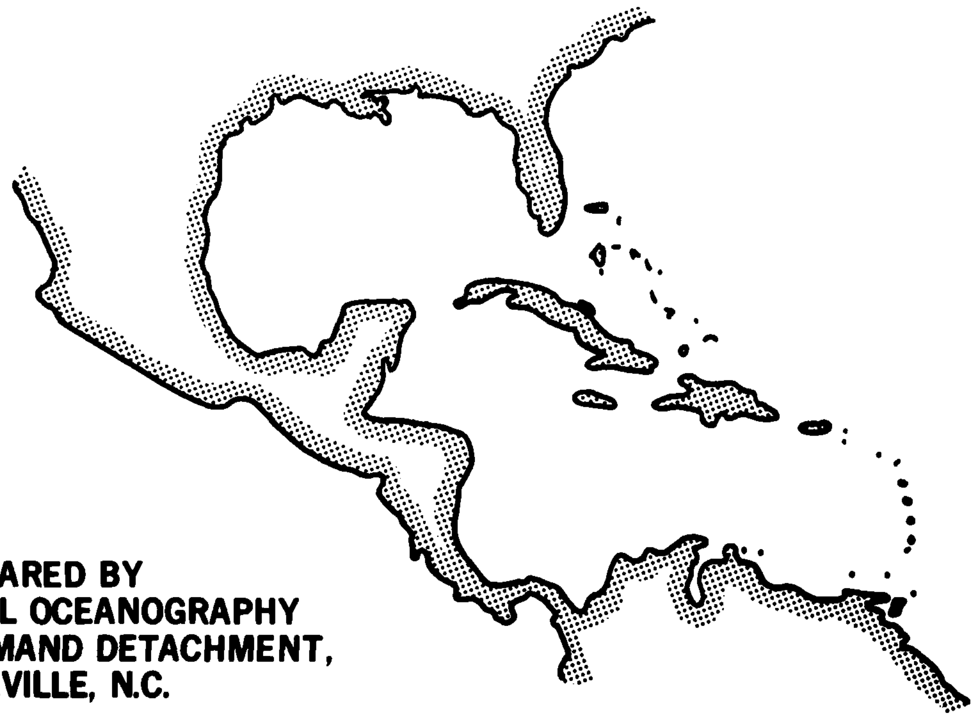
MARCH 1986

UNCLASSIFIED NAVAIR 50-1C-544

U.S. NAVY CLIMATIC STUDY OF THE CARIBBEAN SEA AND GULF OF MEXICO VOLUME 2

EAST CARIBBEAN SEA

MARCH, 1986



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NSTL, MS 39529-5000

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The U.S. Navy Climatic Study of the Caribbean Sea and Gulf of Mexico is made up of four volumes which were prepared under the Commander, Naval Oceanography Command and by the Officer in Charge, Naval Oceanography Command Detachment, Asheville, North Carolina. The work was performed at the National Climatic Data Center (NCDC).
Specific acknowledgement of the NCDC staff is made to Mr. J. D. Elms, project leader; Messrs. C. N. Williams Jr., R. G. Baldwin and Ms. P. L. Franks for data processing and digital graphics; Mr. M. J. Changery and Dr. W. J. Koss for technical review; Messrs. M. G. Burgin, J. L. Thomas and Ms. C. L. Herman for their drafting skills.

Geographical and Data Coverage

The series of four volumes covers the Central American Waters from the Gulf Coast of North America to the northern coast of South America. The following figure shows the areas covered by each volume, and how they overlap to provide coverage for the entire region.

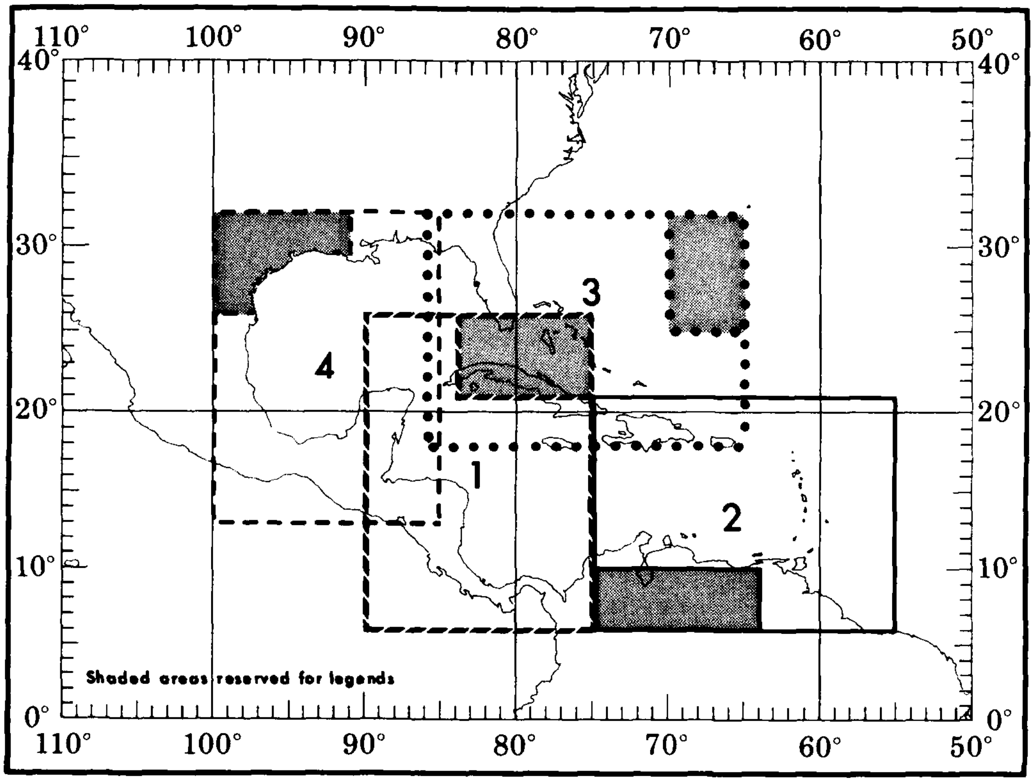

FIG. 1 AREA COVERAGE OF VOLUMES 1—4

This volume, "East Caribbean Sea," covers Region 2 as outlined on the above map (Fig. 1). It extends from the northern coast of South America to just north of Hispaniola and Puerto Rico, and from east of Jamaica to east of the Lesser Antilles (6°N to 21°N; 55°W to 75°W).

Greatest effort and detail were given to the charts and analyses of the marine areas. Surface marine statistics are presented on monthly charts in the form of graphs, tables, and isopleth maps. Land station data appear mostly as graphical presentations within the text. A significant problem in trying to define the climate over many of the areas of Central and South America is the lack of data. Political instability and changing economic conditions create periods when little observational data are collected, and in many cases where data does exist it is often fragmented and neither summarized nor published. For some regions only data collected by the European colonialists are available.

The marine data were machine plotted by one-degree quadrangle and then subjectively analyzed. Graphs and tables of marine-area data are also presented by one-degree quadrangle (e.g., visibility, wave heights, and wind roses). These graphs and tables represent the objective compilation of available data. Those data were not adjusted for suspected biases (low observation count, heavy weighting of observations taken during a short time interval, biases in coding of observations from various source decks, etc.), hence differences may be found when comparing the graphical data with the isopleth analyses. The total number of observations for a given one-degree square should always be considered when interpreting the data as there may not be a sufficient number to permit climatically representative statistics.

Nearly one million two hundred thousand surface marine observations were used in computing the statistics for this volume, and over six million for the total region (4 volume set). These data, taken from NCDC's Tape Data Family 11 (TDF-11), were collected by ships of various registry from as early as 1854 to 1983, with the bulk of the observations being collected in the last 30 years. This is significant because the more recent observations contain more elements than pre-1948 reports. Observation density is greatest along the major shipping routes. In this study area most ship traffic moves north-south passing through the Mona Passage (between Puerto Rico and Hispaniola) or the Windward Passage (between Hispaniola and Cuba) on its way to or from the Panama Canal.

Sea surface current information was extracted from the Naval Oceanographic Office Special Publications 1400-NA9 Surface Currents Southwest North Atlantic Ocean Including the Gulf of Mexico and Caribbean Sea.

Physical Features

Four major physical-geographic regions are found within the four-volume study area: the mountains (highlands) of Central America and northwest South America, the tropical savanna of eastern Mexico and Pacific Coast of Central America, the humid subtropical lowlands across the southern United States, and the tropical rainforest along the southeastern Atlantic Coast of Central America and on the windward (eastern) side of most of the West Indies Islands.

Low-lying coastal plains cover a rather wide expanse across the southern United States. Elevations remain below 600 feet for some 150 to 200 miles inland before reaching the foothills of the Appalachians in northern Alabama and Georgia, the Ouachita Mountains of Oklahoma and Arkansas, or the Edwards Plateau in Texas. A much narrower coastal plain extends down the east coast of Mexico and it is a relatively short distance inland before the rapidly rising escarpment of the Sierra Madre Oriental Mountains is encountered. Atop this range is a relatively flat plateau extending a major portion of the length of Mexico with mountain peaks reaching 18,000 feet across its southern end. Similar elevation changes and narrow coastal plain occur along the west coast of Mexico where the Sierra Madre Occidental mountain range borders the plateau (reference Topographic Chart, Fig. 2, and geographical locator chart Fig. 3). A rather abrupt break in the mountain range occurs at the southern end of the Bay of Campeche which provides a narrow passage between the Atlantic and Pacific (known as the Istmo de Tehuantepec). Similar breaks occur in southern Nicaragua and across Panama. From the Istmo de Tehuantepec a rather broad coastal plain extends across the Yucatan Peninsula and along the Atlantic Coast of Honduras and Nicaragua. Rugged mountains again rise along the west coast with heights reaching above 13,000 feet in Guatemala and 11,000 feet in Costa Rica.

Two chains of active volcanic ridges extend along major earthquake faults; one chain runs up the Lesser Antilles Island group and the second up the west side of Central America from Colombia to southern Mexico. Scattered throughout the West Indies are numerous islands with the majority falling along the major fault line, this creates the semblance of a stepping-stone pattern from Florida to Venezuela. The larger islands in the group (Cuba, Hispaniola, Jamaica, and Puerto Rico) form the Greater Antilles, and the smaller islands (Virgin Is., Windward Is., Leeward Is., and the islands in the southern Caribbean north of Venezuela) extending south from Puerto Rico to South America, the Lesser Antilles. The Bahama Islands, which lie to the southeast of Florida and north of Cuba, are the third and final major group making up the West Indies.

The highest elevations in the West Indies are found on Hispaniola where peaks reach above 10,000 feet. Peaks as high as 7,000 feet are located on Jamaica with elevations reaching 6,000 feet in southern Cuba. Four-thousand foot peaks occur on Puerto Rico and a few of the smaller islands. Much lower peaks are found on the remaining islands.

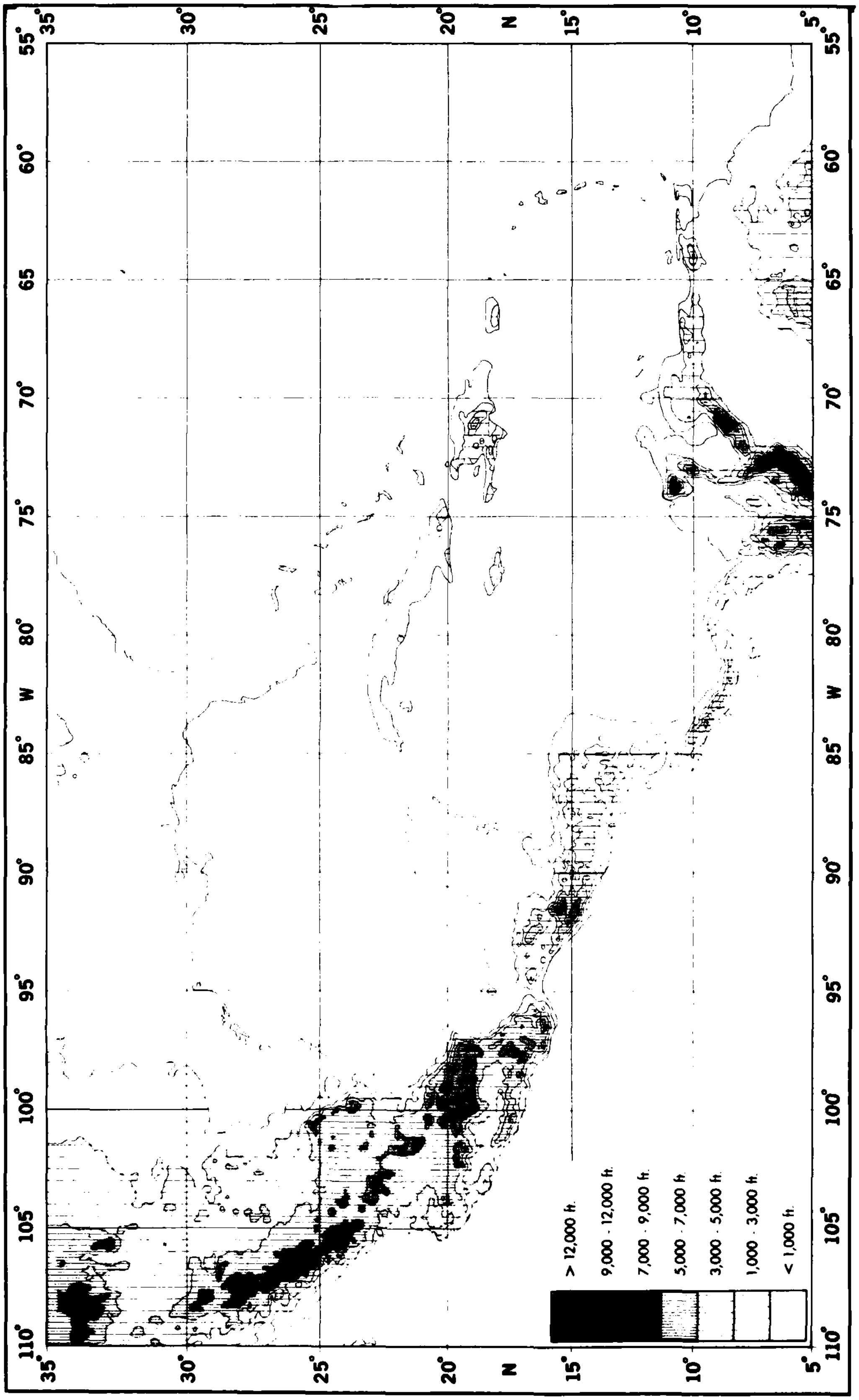

FIG. 2 TOPOGRAPHICAL CHART

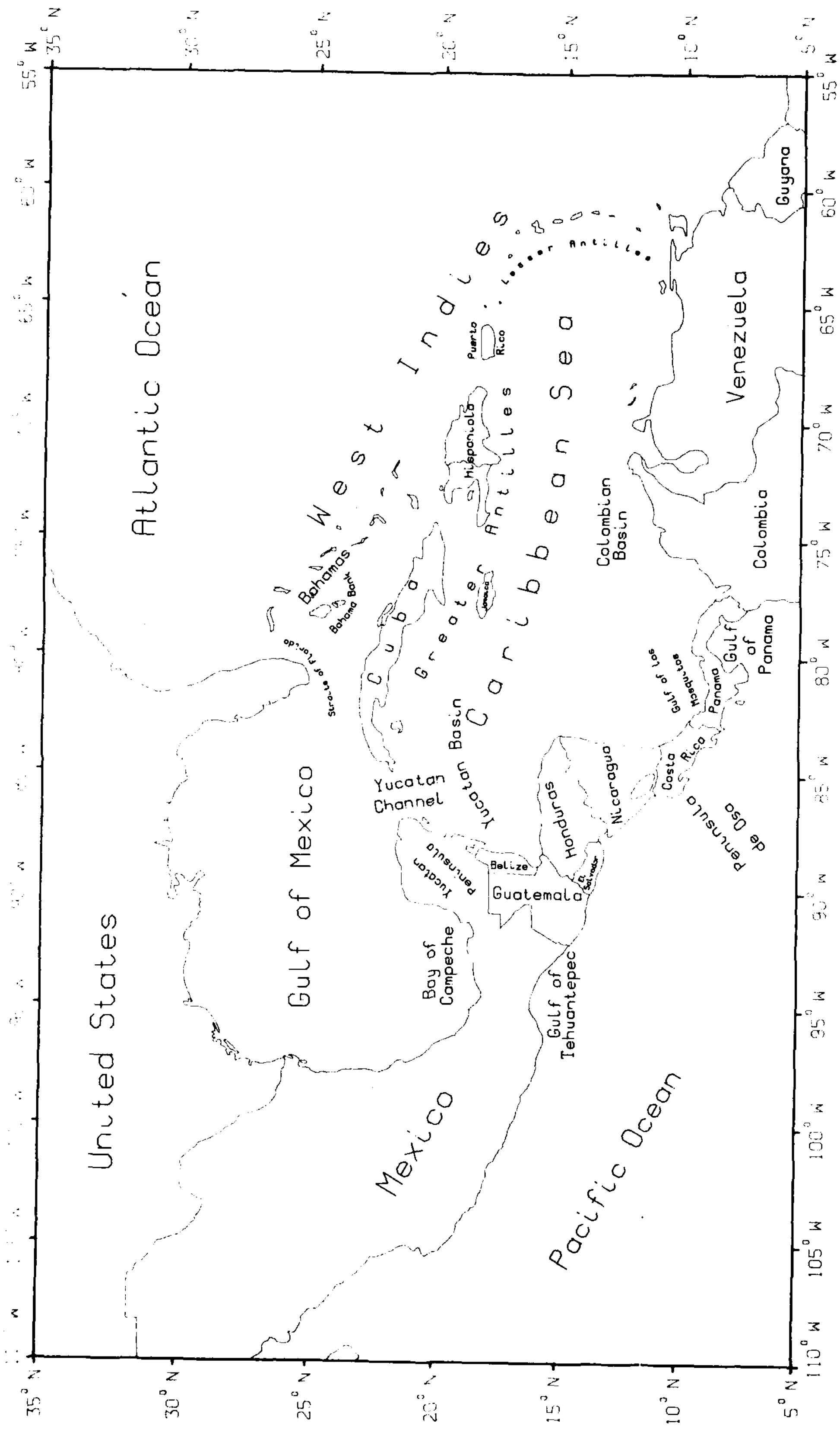

FIG. 3 GEOGRAPHICAL LOCATOR CHART

Figure 4 shows the bathymetry (water depths in fathoms) of the Central American Waters. A broad continental shelf lies along the west coast of Florida extending along the U.S. Gulf Coast narrowing somewhat near the Alabama-Florida state line but then broadening out again until reaching northern Mexico. A rather narrow continental shelf extends down along the east coast of Mexico before widening out significantly along the northwest coast of the Yucatan Peninsula. Another broad shelf area extends from northeast Honduras eastward towards Jamaica. Other broad continental shelf areas include the Bahama Bank, northeast coastal region of South America, and a few smaller areas along the west coast of Cuba. Along the Pacific Coast of Central America a narrow continental shelf runs the full length of the coast except for the Gulf of Panama.

Depths of over 12,000 feet are found in only a few regions of the Gulf of Mexico, but they are rather common in the Caribbean basin. Bathymetry surveys have shown depths of over 20,000 feet in the Cayman Trench south of the Cayman Islands, and over 25,000 feet, the deepest in the Central American Waters, in the Puerto Rico Trench which lies north of the island.

Climate

The northern portions of the Central American Waters lie in the subtropics while southern sections lie within the tropics. This generally means that the Caribbean Sea is under the influence of the easterly trade winds, and the northern part of the Gulf of Mexico the mid-latitude westerlies. Although most parts of the region will feel the effects of both tropical and subtropical conditions, an ill-defined zone exists between the two that is subject to both influences. During the winter, cold air occasionally pushes deep into the Gulf of Mexico with westerly winds often being observed as far south as the southern end of the Mexican Plateau. However, their appearance this far south is often related more to altitude than latitude. The structure of the trade winds is generally rather shallow with the easterlies normally giving way to the upper westerlies (antitrades) above 3,000 feet.

The general circulation over the area is controlled mostly by the North Atlantic subtropical high, which is commonly known as the Azores or Bermuda high, (Fig. 5). Flow along its southern edge produces the large scale northeastern flow known as the trades, the most globally consistent winds for directional constancy. Trade winds are at their weakest during the winter, the dry season, and their strongest during the summer, the wet season. The trades do not generally contain a deep moist layer because of an inversion that usually appears at 3,000 to 5,000 feet above mean sea level. Below this inversion it is quite moist whereas above the inversion it is relatively dry and cloudless. An almost mirror image of the trade wind inversion appears between the northern and southern hemispheres. Equatorward of 15° latitude the inversion rises both westward and equatorward to heights of over 6,000 feet, encircling the equatorial trough. Termination of the trade wind inversion usually takes place in the middle latitudes and variations in the inversion for given locations have proven significant between individual observations (Riehl, 1979). Within the equatorial trough zone and over western portions of the trades the inversion often disappears and it is not considered to be a mean condition. Broad scale subsidence of air within the subtropical high establishes the trade wind inversion. The greatest descent of air takes place across the high's southeastern quadrant which causes the inversion to be generally lower and stronger over the eastern portions of the ocean.

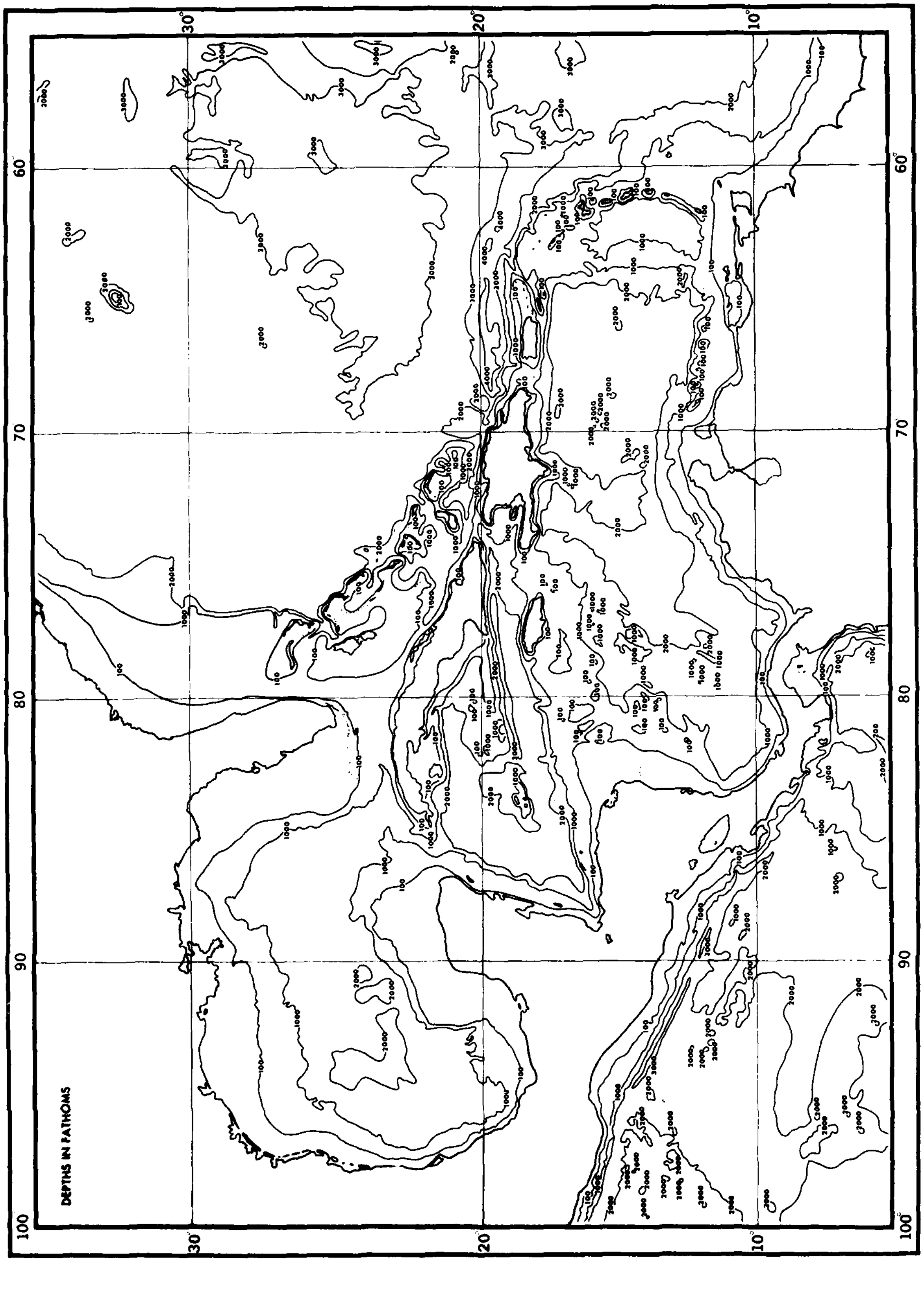

FIG. 4 BATHYMETRY CHART

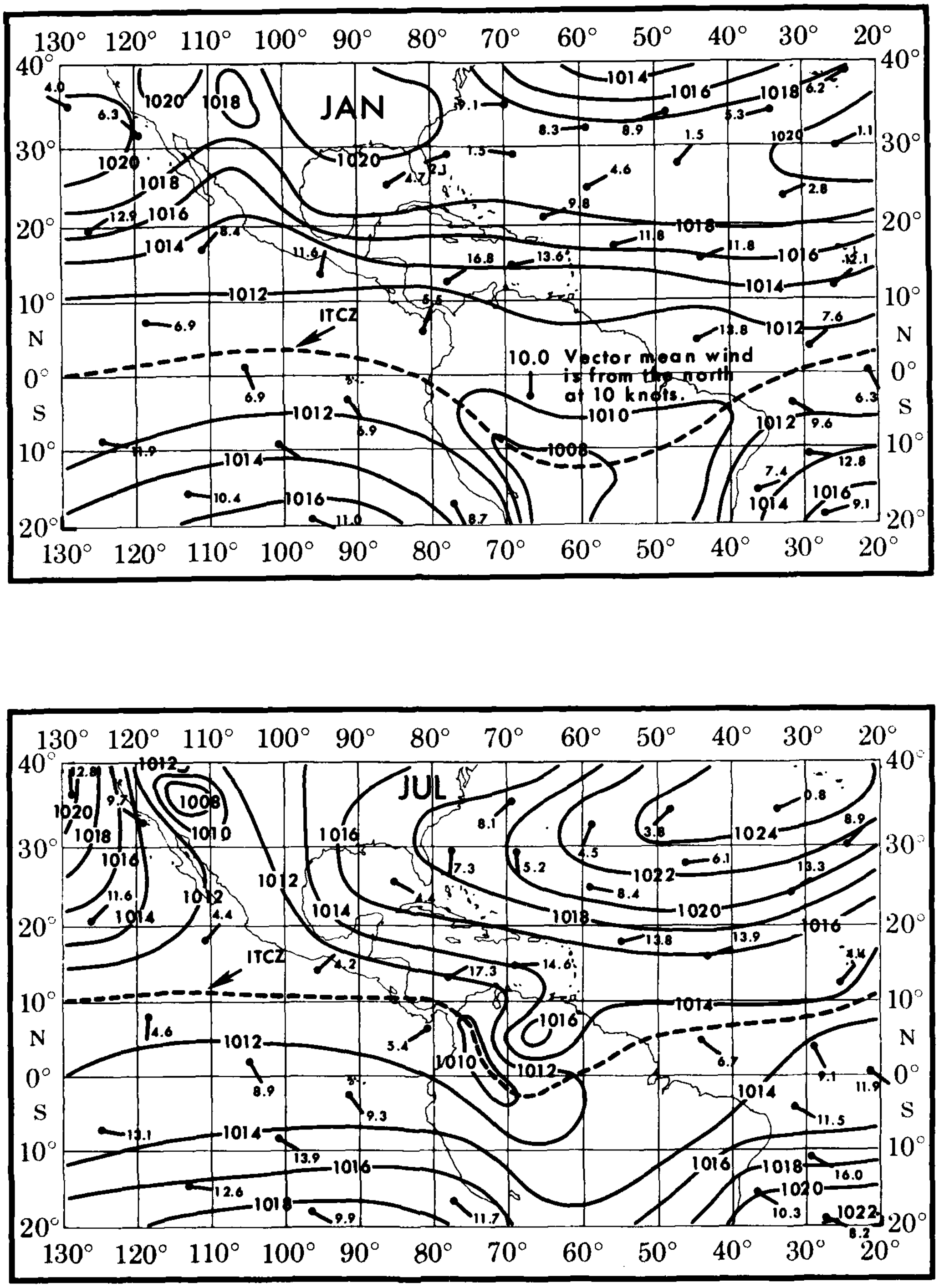

FIG. 5 MEAN EQUATORIAL TROUGH AND VECTOR MEAN WINDS

The Intertropical Convergence Zone (ITCZ), a belt of relatively low pressure lying between the subtropical highs of the northern and southern hemispheres, is another significant climatic feature. This belt is often referred to by many names such as the equatorial trough, trade wind trough, intertropical front, equatorial front, cyclonic directional shear zone, etc. It was originally described as the dividing line between the northeast and southeast trades. Continued research has shown this system to be complex, because it is not necessary for the equatorial trough, the wind convergence zone and maximum cloudiness to coincide. Godshall (1968) showed that a displacement exists between the maximum cloud cover areas and the convergence zone centers and that some of the displacements are quite large. Water vapor transferred from the sea to the atmosphere becomes trapped below the trade inversion and is thus transported to the ITCZ by the trade winds themselves (Augstein, 1976). A good schematic of this process, adapted from Augstein (1976), is shown in Figure 6.

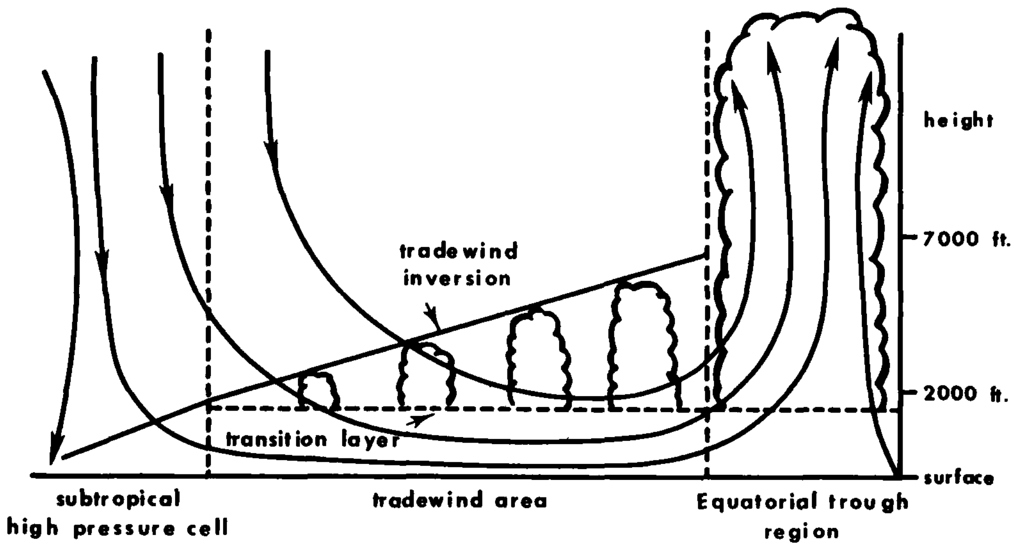

FIG. 6 EQUATORIAL TROUGH/TRADE WIND SCHEMATIC

Movement of the ITCZ, northward and southward, is in harmony with the sun's movement and the resultant strengthening and weakening of the subtropical highs. Studies have shown that the global seasonal progression has its smallest annual displacement between approximately 40°W and 160°W (Riehl, 1979; Balek, 1983) which results in the equatorial trough barely pushing into the Caribbean region even during its most northern extent. During the wet season the equatorial trough tends to lie northwest-southeast across southern Central America (see Fig. 5) affecting the eastern Pacific most significantly.

Continuous change is associated with the ITCZ, from periods with locally heavy downpours to those with clear skies. Large displacements of the zone itself are often observed. Typically there are regions experiencing heavy convective activity while others in close proximity are experiencing no significant weather. An example of such conditions within the ITCZ is seen in Figure 7 (NASA, 1977) where a continuous band of clouds appears over the eastern Pacific while some relatively clear areas appear over the Atlantic.

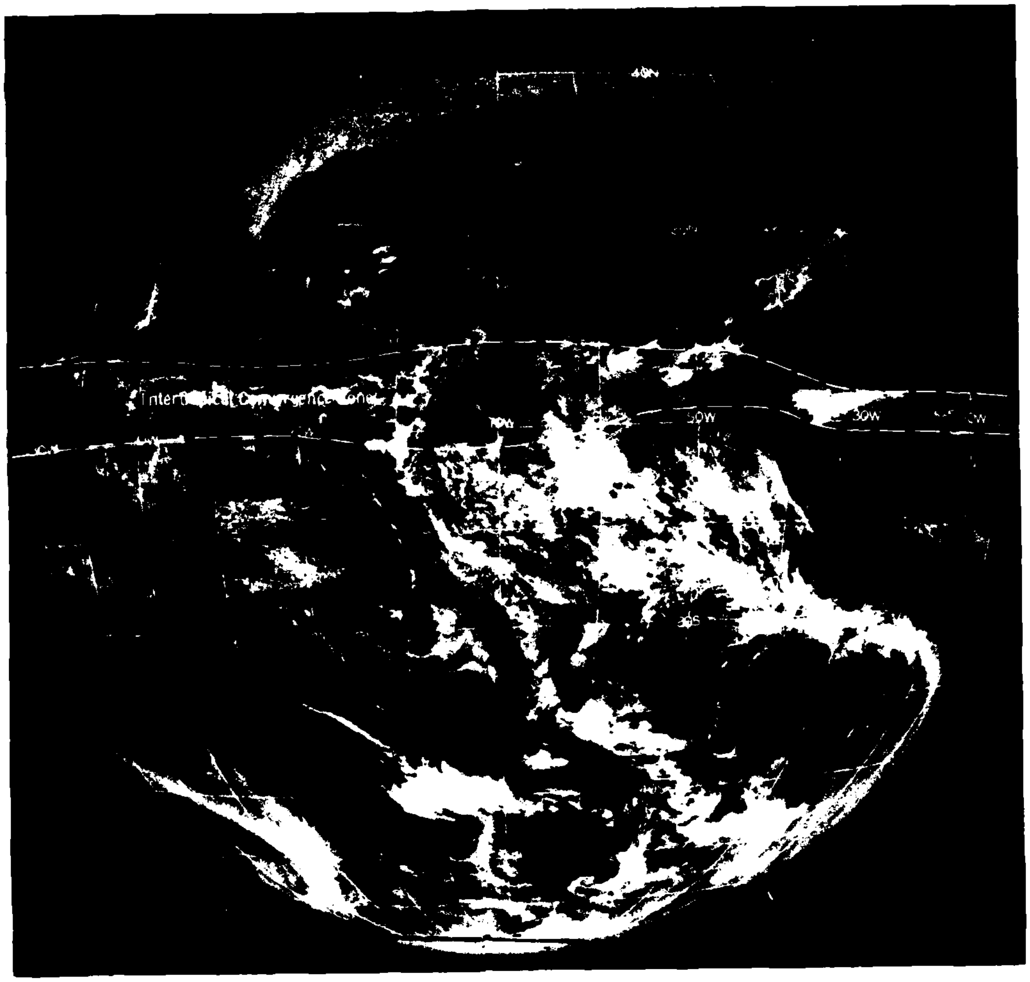

FIG.7 SATELLITE SYNOPTIC IMAGE (JANUARY 3, 1974, 12:20 GMT)

Two distinct precipitation seasons are typical for most regions of the Central American Waters. An exception is along the Gulf Coast of the United States where four distinct seasons associated with the middle latitudes prevail. Intermonthly precipitation averages differ little throughout the Gulf Coast region. A small maximum is noted in July and a minimum in October. For the large remaining portion of the study area, basically only wet and dry seasons are discernible. The wet season normally runs from May through November with the dry season covering the remaining months. Since the sun's position changes little in the tropics the temperature cycle is typically stable with little annual variation. Since expected temperatures are of little concern, the important question is whether the rains will come as expected, for they spell success or failure of the crops. Normal rainfall depends on the major circulation patterns coming into play as the North Atlantic subtropical high builds during the summer season. With its development, easterly winds become stronger aloft transporting increased moisture necessary for the seasonal rains. Orographic effects play an increasingly important role along with convergence and surface heating, as any one of these can trigger the instability necessary for producing rain showers and thunderstorms. As the North Atlantic subtropical high weakens during the winter (see Fig. 5) the westerlies again dominate the flow aloft, cut off the moist easterly flow, and thus bring on the dry season.

Occasionally outbreaks of cold continental air from North America will push into the Gulf of Mexico and Caribbean during the height of the dry season (December through March) bringing precipitation mainly to the coastlines and windward slopes. These cool surges of air are referred to as "northers" and generally bring stronger-than-normal winds and below-normal temperatures as far south as Panama and the southern Caribbean. Northers are modified rather quickly by the tropical environment, thus they affect an area for only one to two days.

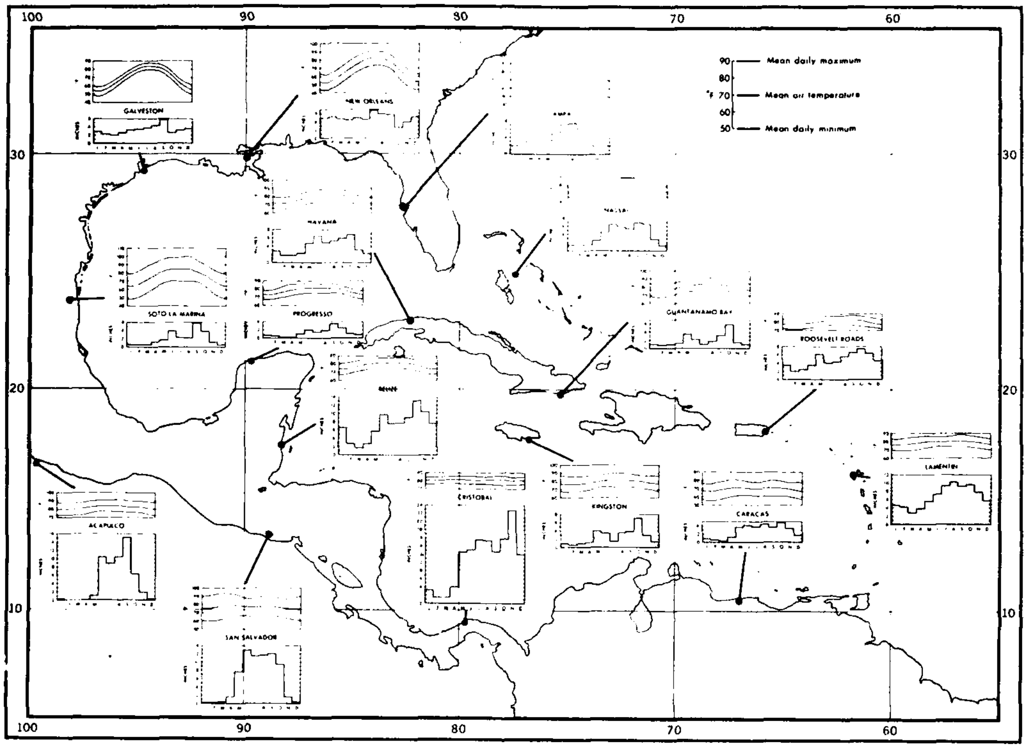

FIG. 8 MONTHLY MEANS OF AIR TEMPERATURE AND RAINFALL

Latitude and maritime influences minimize temperature variations and keep the annual temperature range relatively small. This can be seen in Figure 8 where monthly means of air temperature and rainfall for selected stations are presented. Mean annual temperature ranges are greatest at the higher latitudes, averaging $25^{\circ}F$-$30^{\circ}F$ along the Gulf Coast of the U.S. and $10^{\circ}F$ or less for most regions south of $20^{\circ}N$. Exceptions south of $20^{\circ}N$ are found at some of the higher peaks and across most of Mexico north of $16^{\circ}N$ and west of $92^{\circ}W$, except for along the Pacific Coast. Diurnal temperature ranges within the tropics are much greater than the monthly mean temperature differences between the warmest and coldest months. Cloudiness is an important factor because it restricts the afternoon maximum temperatures during the rainy season, whereas, the lack of cloud cover during the dry season permits more nighttime cooling resulting in lower minimum temperatures. Northern Mexico and the southern coastal plains of the U.S. experience wintertime mean temperatures of $55^{\circ}F$ to $60^{\circ}F$ with average summer temperatures increasing to $80^{\circ}F$ to $85^{\circ}F$. These summer values are similar in magnitude to those reported in the lower latitudes where seasonal variations are small. The mean freezing level over the Caribbean remains fairly constant throughout the year at 15,000 to 16,000 feet. While freezing level heights remain at these levels over the southern U.S. during the summer, they drop to near 12,000 feet during the winter. Annual variations in the mean tropopause height are also small; the tropopause is usually at from 45,000 to 50,000 feet, across the entire study area.

Tropical cyclones are the most feared and devastating weather phenomena of the region. Annual frequencies of these storms vary widely among years. For the period 1871 through 1984, for which there are reasonably good records in the North Atlantic, the least activity occurred in 1890 and 1914 when only one tropical storm was reported. The most active years were 1933, when 21 tropical cyclones reached tropical storm strength (34 knots or greater), and 1969 when 12 reached hurricane strength (64 knots or greater). In the North Atlantic Basin, the main tropical cyclone season runs from August through October with significant occurrences in June, July, and November. April is the only month in which no tropical cyclone has ever been reported within the North Atlantic basin.

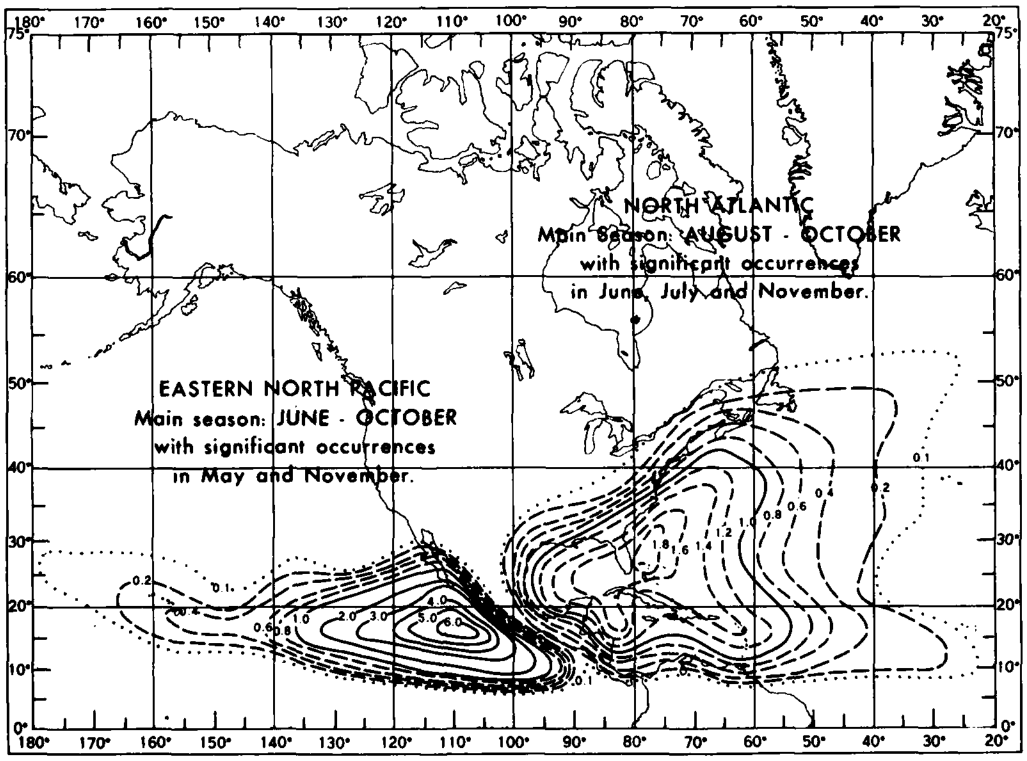

FIG. 9 AVERAGE NUMBER OF TROPICAL CYCLONES PER 5° SQUARE PER YEAR

Highest annual occurrences of tropical cyclones by five-degree square are found in the eastern North Pacific where the main season is from June through October with significant occurrences in May and November. Fortunately most of these storms track west-to-northwestward out to sea with few affecting Central America. The average number of tropical cyclones per five-degree square per year is given in Figure 9 and the annual 12-hourly movements by five-degree square of tropical cyclone centers with tropical storm intensity or greater are shown in Figure 10. Both figures were adapted from Crutcher and Quayle (1974), a major work produced for the U.S. Navy which presents frequencies and preferred tracks for worldwide tropical cyclones.

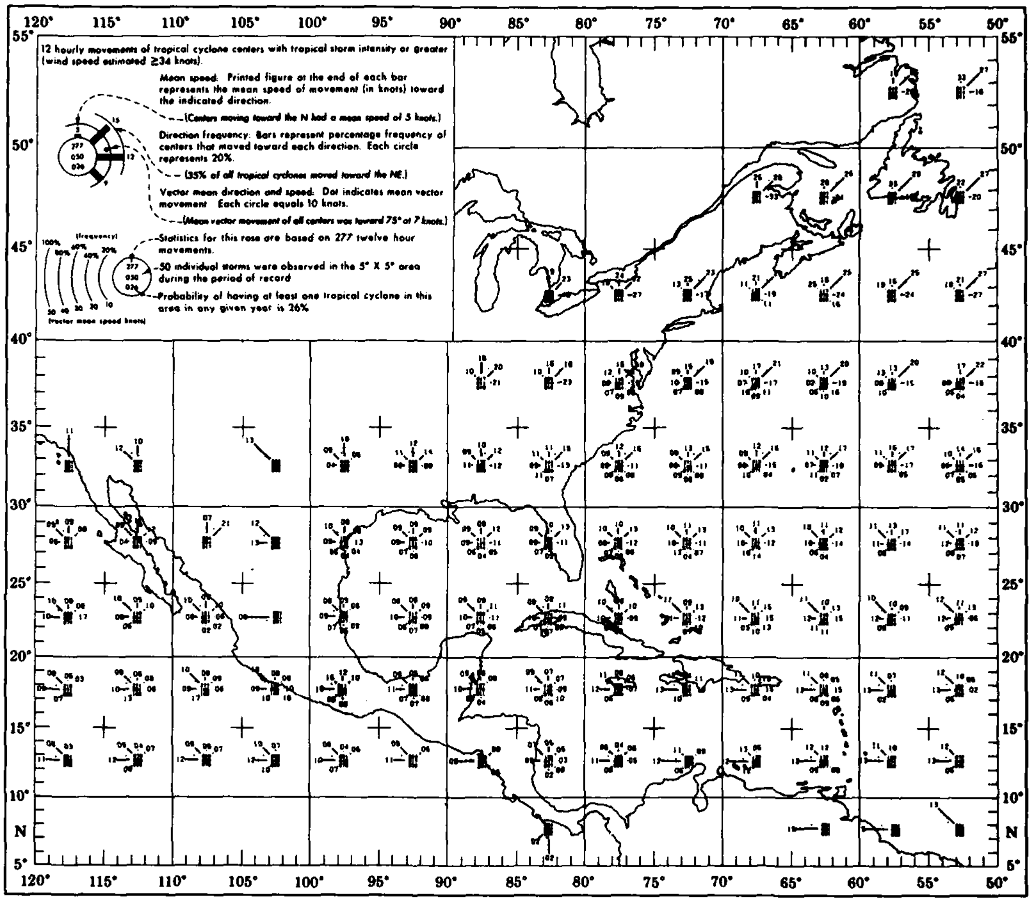

FIG. 10 ANNUAL 12 HOURLY MOVEMENTS OF TROPICAL CYCLONE CENTERS WITH TROPICAL STORM INTENSITY OR GREATER

Marine Climatological Elements

Precipitation

Of the elements recorded in the marine data base, precipitation is the one most subject to error in both the way it is observed and the way it is interpreted. In many areas of the world, especially in more recent years, ships try to avoid foul weather and thus bias the data towards fair weather.

Because of the limited occurrence of precipitation throughout Region 2, basic seasonal patterns are difficult to establish. Present weather observations from ships reporting precipitation remain low, averaging two to eight percent through the year. The lowest frequencies are generally observed between the northern coast of South America and Hispaniola with slightly higher occurrences generally being found east of the Lesser Antillies and northeast South America. The driest period appears from February through May with frequencies generally averaging less than five percent. During June frequencies increase above 10 percent southeast of the Lesser Antillies reaching the yearly maximum, but then quickly dropping to an average of 5 to 8 percent from July through December. For most of the year only two to three percent of the present weather observations taken between South America and Hispaniola report precipitation, however, a slight increase of one to two percent is detected from November through January.

Assessing oceanic rainfall data is a major problem because transit ships are unable to take quantitative precipitation measurements. A number of studies have been conducted in efforts to predict precipitation amounts or rates of fall based on estimates derived from the use of present weather observations from ships of opportunity (Goroch, et al., 1984) and readings from satellites (Rao, et al., 1976).

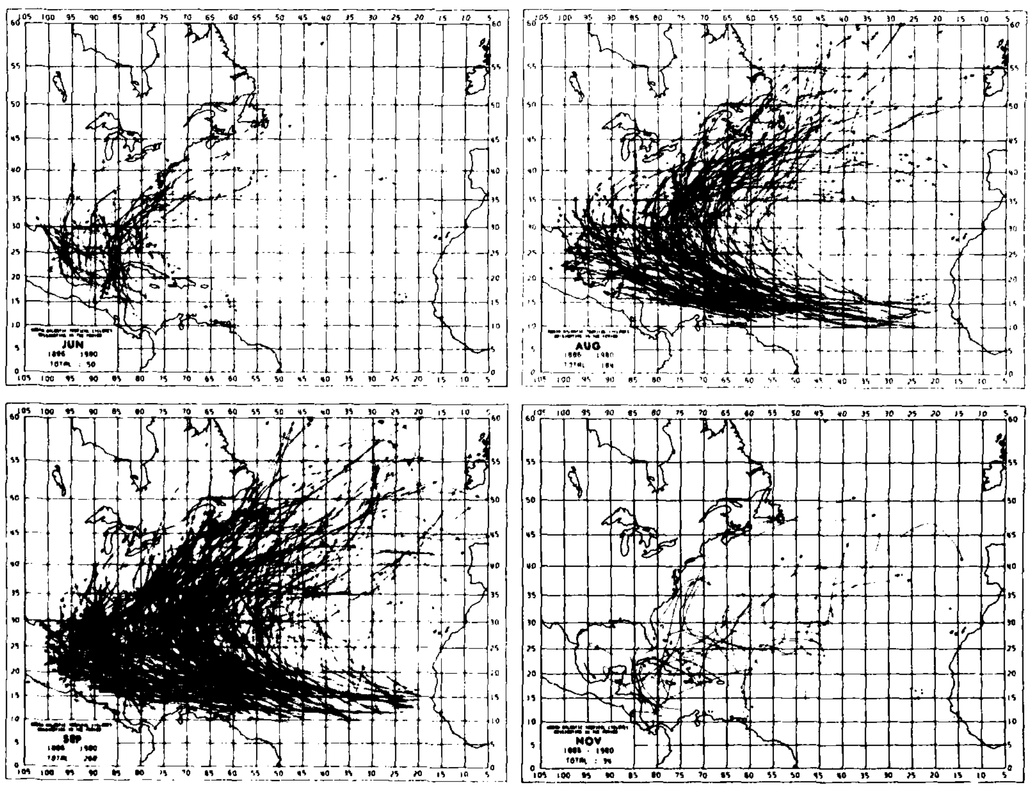

FIG. 11 TROPICAL CYCLONE TRACKS (JUN, AUG, SEP, AND NOV)

Tropical Cyclones

Typically, most tropical cyclone development during the early part of the hurricane season (May and June) occurs in the western Atlantic (Caribbean Sea and Gulf of Mexico). Later in the season (July through September) more development occurs in the central and eastern sections, and the seasonal finale (October and November) distribution is more evenly divided between the eastern and western halves of the tropical Atlantic. To illustrate how storm development shifts with the season, tropical cyclone tracks for storms originating in June, August, September, and November (1886-1980) are presented in Figure 11.

By referring back to Figure 10, inference can be made on preferred tracks for the region along with the annual probabilities of encountering a storm. From Figure 9 one can see that for Region 2, the chances of encountering a tropical storm increase most with increased latitude.

Air Temperature

Air temperature is one of the most frequently observed elements by mariners. On many ships the heating effect of the ship's structure has a tendency to produce higher than actual ambient air temperature readings because of instrument exposure. This is especially true in the tropics where sunny, calm days are numerous. For this study area the problem is somewhat tempered by the strong trade winds.

For each month the mean air temperature distribution over Region 2 is nearly isothermal with the mean temperatures rarely varying by more than two to three degrees Fahrenheit across the entire region. The isotherm pattern is rather zonal during the cooler month (December though May) with mean temperatures ranging from 77°F to 81°F, and the pattern becomes more meridianal during the warmer months (June through November) with mean temperatures ranging from 81°F to 83°F.

Sea Surface-Temperature

Sea-surface temperatures are recorded with a fairly high frequency in marine observations. The principle methods for sampling are intake thermometers and buckets. Even though the two methods can produce slightly different results, the data can be used with considerable confidence.

Seasonal variations in mean sea-surface temperatures are small throughout Region 2 as monthly means range from just under 77°F to just over 84°F for the 12 months. From January through March mean sea-surface temperatures are at their coldest ranging from just under 77°F to just over 81°F while during the warmer months (June through October) mean sea-surface temperatures range from just under 80°F to just over 84°F. Isotherm patterns generally show warmer mean sea-surface temperatures over the Venezuelan Basin with cooler values off the coast of South America and to the north and east of Puerto Rico.

Surface Winds

Surface wind is one of the most commonly observed elements. Many of the observations from the NCDC data base are visual observations based on the roughness of the sea. In recent years more ships acquired anemometers and reported measured winds. Prior to 1963 many of the wind speeds were recorded in the Beaufort scale; such estimates have proven to be quite reliable and can be used with a high degree of confidence. Five sets of wind speed isopleths are presented: mean speed, the percent frequency of winds less than 11 knots, 11 to 21 knots, 22 to 33 knots, and greater than or equal to 34 knots. Also included are wind roses, by one-degree square.

Throughout the year the northeasterly trades maintain good strength and constancy across the Caribbean Sea (reference Fig. 5). Mean wind speeds average near 20 knots in the vicinity of the Colombian Basin (western portion of Region 2) from December through July with the exception of May. They weaken significantly from September through November with mean speeds dropping below 14 knots over the Colombian Basin during October. Over the central and eastern sections of Region 2 mean wind speeds generally average 4 to 7 knots less than these maximum mean speeds observed over the Colombian Basin. Slightly lower speeds are observed along the northeastern South American coast.

Gale force winds ($\geq$34 knots) reach a maximum of five percent during January over the Colombian Basin just west of Region 2 and except for this narrow section along the western edge of Region 2 all other areas report averages of less than one percent. Gale frequencies decrease along this western edge until all sections report frequencies of less than one percent during September and October. This drop during the peak of the hurricane season results from the contributions from tropical cyclones not being sufficient to offset the corresponding drop in the strength of the surface trades. During November, a small area is again established along the western edge of Region 2 where gale frequencies exceed one percent.

Mean monthly frequency patterns for wind speeds less than 11 knots change little throughout Region 2 during the yearly cycle. During winter, the frequencies are less than 10 percent over the Colombian Basin and less than 30 to 40 percent over the Venezuelan Basin. Frequencies as high as 50 to 70 percent are found along the sheltered coasts of South America, and the islands of Hispaniola and Puerto Rico. Summer generally brings an increase of appoximately 10 percent in reported wind speeds of 10 knots or less across all sections of Region 2.

The changing of wind speed threshold values does not alter the wind speed patterns because stronger winds still appear over the open ocean (Colombian and Venezuelan Basins) and the weakest ones near sheltered shores. Monthly mean wind speeds of 11 to 21 knots are reported over the open waters of Region 2 nearly 70 percent of the time during June and July, 50 percent for September through November and 60 percent for all remaining months. Near shore frequencies range from 20 to 50 percent for the year with slightly higher occurrences appearing from January through April.

Speeds of 22 to 33 knots are observed less frequently during October than any other month with frequencies averaging less than 10 percent throughout Region 2. Observed frequencies peak in the two periods January to February and June to July with frequencies averaging over 40 percent over the Colombian Basin and over 10 percent east of the Lesser Antillies. Frequencies are less than this in the remaining areas of Region 2.

<u>Visibility</u>

Visibilities are difficult to measure at sea because of the lack of distance reference points. Climatically, many low visibility observations are probably missed because the observer is too busy with other duties (fair weather bias). However, the coarseness of the visibility code intervals tends to minimize the problem thereby permitting the summarized data to be relatively consistent.

Visibility tables, as in previous volumes, are presented by one-degree quadrangle. One trend is noted in that visibilities are generally good throughout Region 2 averaging five miles or better at least 90 percent of the time regardless of the month. Also, no seasonal or monthly shifts between threshold categories are detectable for Region 2, although some slight seasonal shift between the top two categories for Region 1 was apparent. Those subtle shifts in Region 1 took place between the wet and dry seasons which are much better defined than those for Region 2.

<u>Clouds</u>

A survey of the cloud data (total and low cloud amounts) from the marine data base shows a number of total clouds reports significantly greater than low cloud amounts. This is because many of the early marine observations contain only total cloud amounts. For the two presentations (total cloud amount $\leq$ 2/8 and low cloud amounts $\geq$ 5/8) only those observations reporting both total and low cloud amounts were summarized. This helps eliminate problems introduced as a result of different size data bases (N-count). The use of satellite data helps bolster confidence in the total cloud analyses because they show fairly close agreement with those analyses (U. S. Department of Commerce and United States Air Force, 1971).

Consistency best describes the mean cloud pattern over Region 2. For example, the percent frequency of low clouds greater than or equal to five oktas generally averages slightly below 20 percent over the Venezuelan Basin, and slightly above 20 percent over the Colombian Basin and across the region east to southeast of the Lesser Antillies. April through June brings a slight increase in low cloud amounts as frequencies increase by 10 percent across the southwest and southeast sections of Region 2. Total cloud amounts of less than or equal to two oktas average near 40 percent from January through March, and nearer 30 percent for the remaining months across most of Region 2, especially the open ocean areas. Near-coastal areas may vary from 10 to 20 percent higher from the general percentages just listed. Except for an occasional tropical cyclone or easterly wave, persistence would be favored when forecasting cloud amounts.

Ceiling and Visibility

Aircraft-type ceilings are not available from marine observations. The ceilings are estimated from the height of the lowest cloud when low clouds cover more than half the sky. When the sky is totally obscured by rain, fog, dust, or other phenomena, the total obscuration is considered a ceiling with a height of zero. Mid-range ceiling and visibility charts (ceiling less than 1,000 feet and/or visibility less than 5 nautical miles; ceiling less than 8,000 feet and/or visibility less than 10 nautical miles) and low range ceiling and visibility charts (ceilings less than 300 feet and/or visibility less than 1 nautical mile; ceiling less than 600 feet and/or visibility less than 2 nautical miles) are presented.

Ceilings less than 8,000 feet and/or visibilities less than 10 nautical miles average near 20 percent for all months except May through July when they increase to near 30 percent. Frequencies across a small area near Puerto Rico, however, average 10 to 20 percent higher than the surrounding area, averaging 30 to 40 percent throughout the year.

The next lower threshold category (less than 1,000 feet and/or 5 nautical miles), averages near 5 percent across most of Region 2 for all months. Frequencies, however, do increase to over 10 percent in the southwest corner from April through July and October through December. Occurrences of 10 percent also appear briefly in the extreme southwest corner of Region 2 during May.

Conditions rarely deteriorate into the lowest threshold category (less than 300 feet and/or 1 nautical mile) as indicated by only one area in June observing frequencies even as high as one percent. For ceilings less than 600 feet and/or visibilities less than two nautical miles monthly frequencies run slightly higher at one to three percent.

Wave Heights

Wave heights have been recorded in a consistent quantitative code since only the late 1940's. The reluctance of many observers to take wave observations in the earlier years and the difficulty in estimating waves, especially in confused seas, make wave observations one of the least commonly observed elements. They are also subject to biases. Generally the heights are too low, the periods too short, and the sea-swell discrimination poor (Quayle, 1980). The data in this study have not been adjusted for the suspected biases but they were processed through a quality control procedure where an internal check was made between wind speed and sea height. The data were also matrix-arrayed and apparent erroneous outliers were deleted in both the sea and swell data. Wave-height presentations include isopleth maps showing percent frequencies of wave-heights $\geq$ 3 feet and $\geq$ 8 feet. In addition, wave-height tables by one-degree quadrangle show frequencies by six wave-height categories. In these presentations, the higher of the sea or swell was selected for summarization. If heights were equal, the wave with the longer period was selected.

Wave-heights of three feet or higher are observed 80 to 90 percent of the time each month across the Colombian Basin and open waters east of the Lesser Antillies. The open ocean between these two regions has wave-heights of this magnitude generally around 10 percent less of the time. Frequencies along the near shore regions of the islands and South America can be as much as 30 to 40 percent less depending on how sheltered the regions are from the prevailing waves.

Ocean Currents

The ocean current charts are compiled principally from ship drift reports that were forwarded by the various merchant marines to the Naval Oceanographic Office. From these drift observations, the set (direction) and drift (speed) of the prevailing currents are calculated for each one-degree square. The density of observations is greatest along the major shipping routes and the reliability of the current charts is best in these areas. The data are considered most useful when used collectively as such in summaries where a large number of observations are available.

Surface current charts displayed for Region 2 are Winter (Jan., Feb., Mar.), Spring (Apr., May, Jun.), Summer (Jul., Aug., Sep.) and Autumn (Oct., Nov., Dec.).

Summary

Large variations in the weather are not experienced at scales that exist in the higher latitudes except during the passage of seasonal tropical cyclones and depressions. In general, weather conditions are pleasant with small diurnal temperature ranges and small intermonthly temperature variations. This is especially true for the marine areas. Land site weather can vary much more depending on elevation, local effects, cloud cover, land and sea breeze, and the effects of ocean currents and sea temperatures. In addition to the persistently warm temperatures, high humidities prevail especially over lowlands and ocean areas.

At lower elevations daily temperatures generally range from nighttime lows in the 60°F's to 70°F's to daytime highs of 80°F's and 90°F's. Temperatures at elevations above 10,000 feet will average 10°F to 20°F lower. Below 3,000 feet, extreme temperatures rarely drop below 40°F although they occasionally rise above 100°F.

Hurricanes are certainly the most destructive natural force in the region, and their associated storm surges prove to be the most damaging phenomenon to low-lying coastal areas because they often rise 10 to 15 feet above normal tide level. Flooding and mudslides also prove dangerous with both usually resulting from a passing hurricane.

Although migratory low pressure systems, such as easterly waves and tropical cyclones, strongly influence the weather from time to time, it is the constancy of the trade winds and high sun angle that establishes the regional climate.

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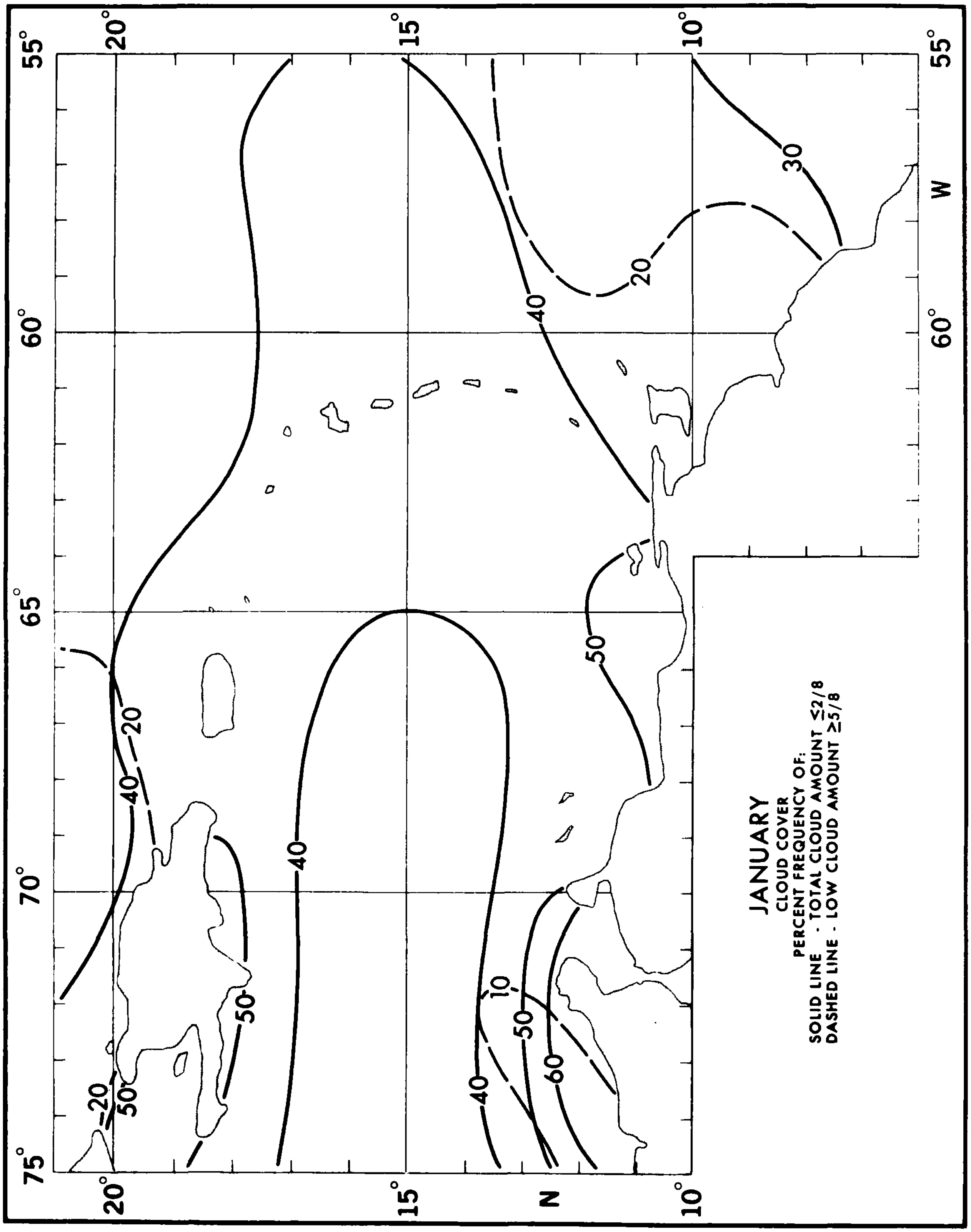
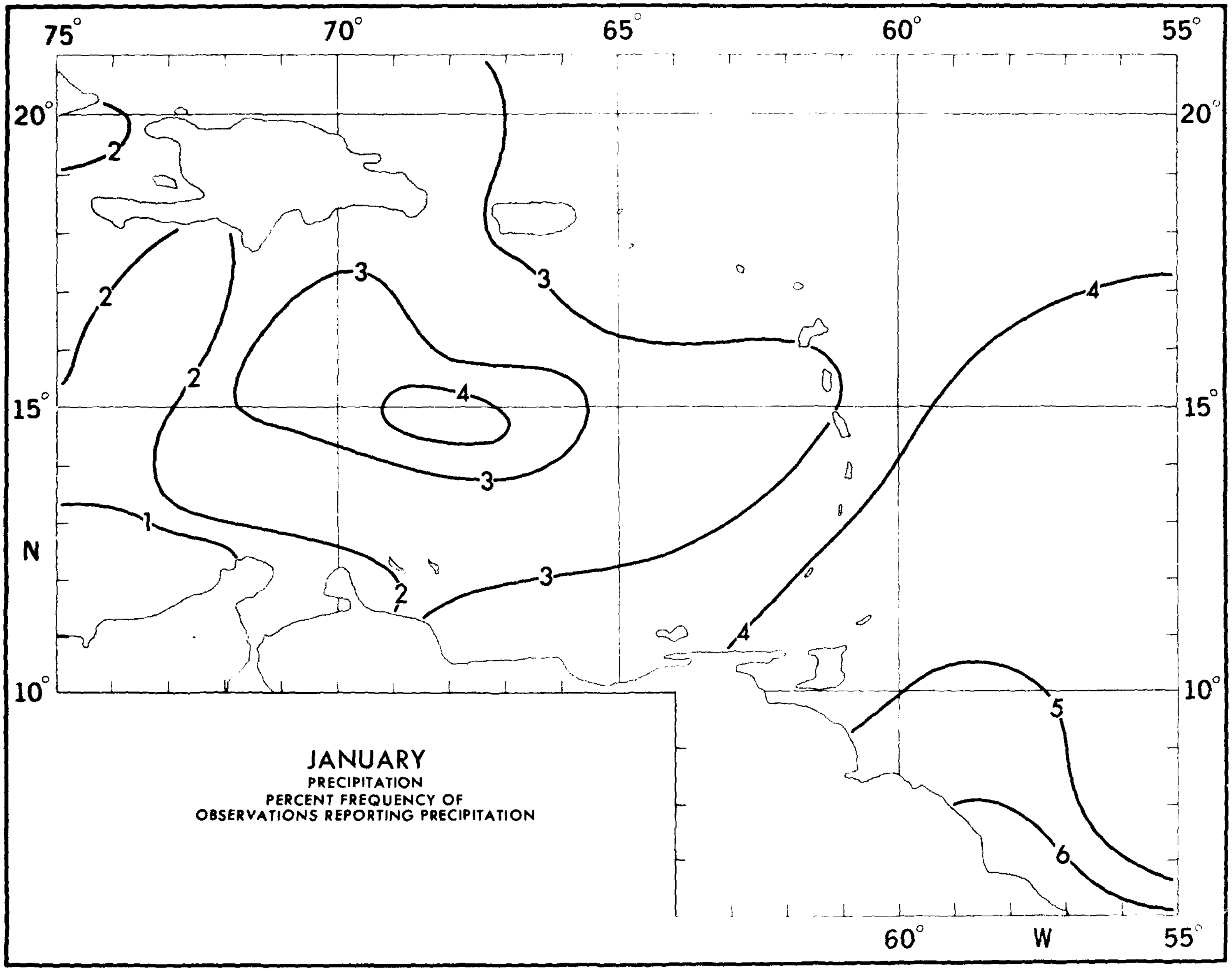
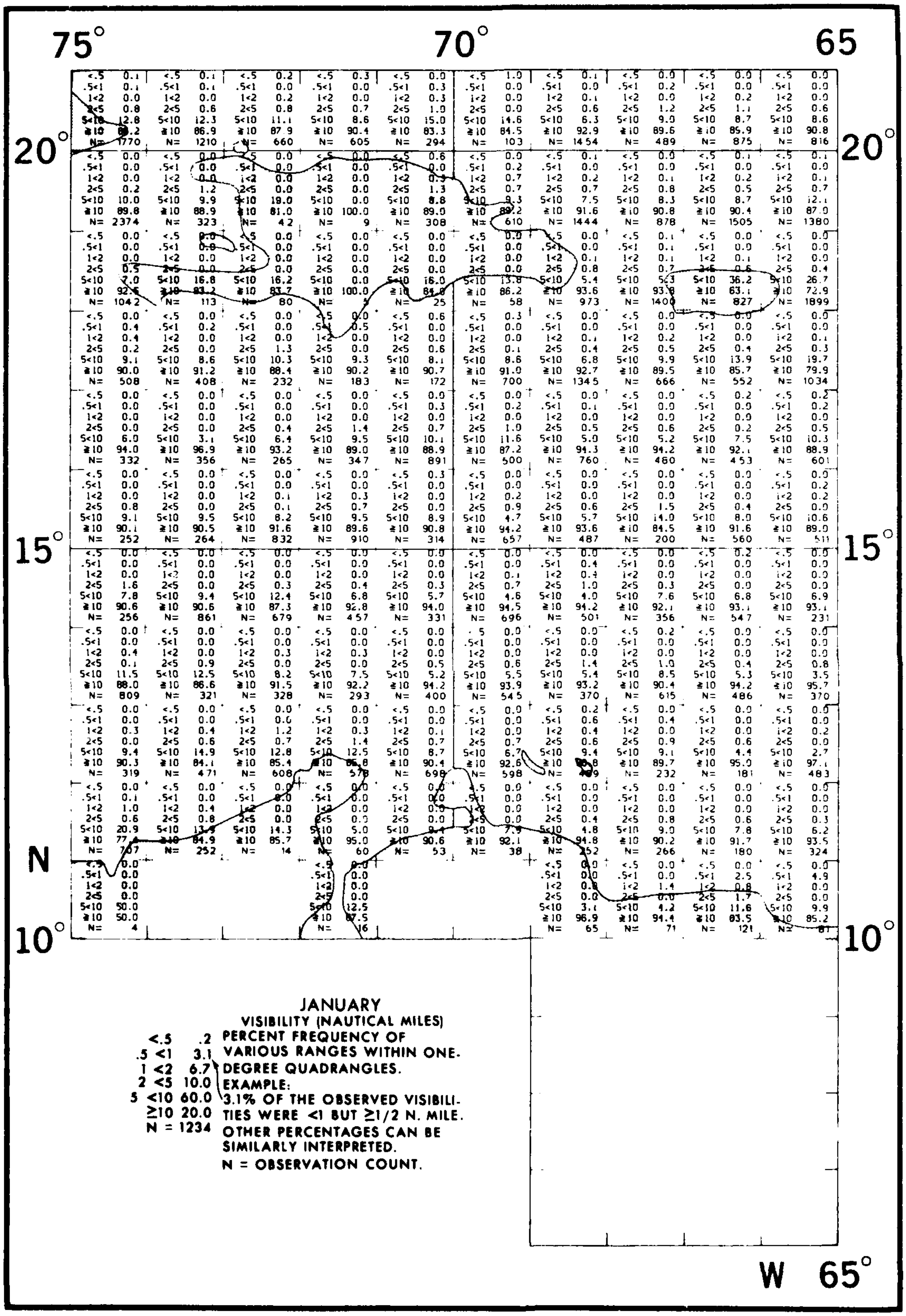


JANUARY
CLOUD COVER
PERCENT FREQUENCY OF:
SOLID LINE - TOTAL CLOUD AMOUNT ≤2/8
DASHED LINE - LOW CLOUD AMOUNT ≥5/8



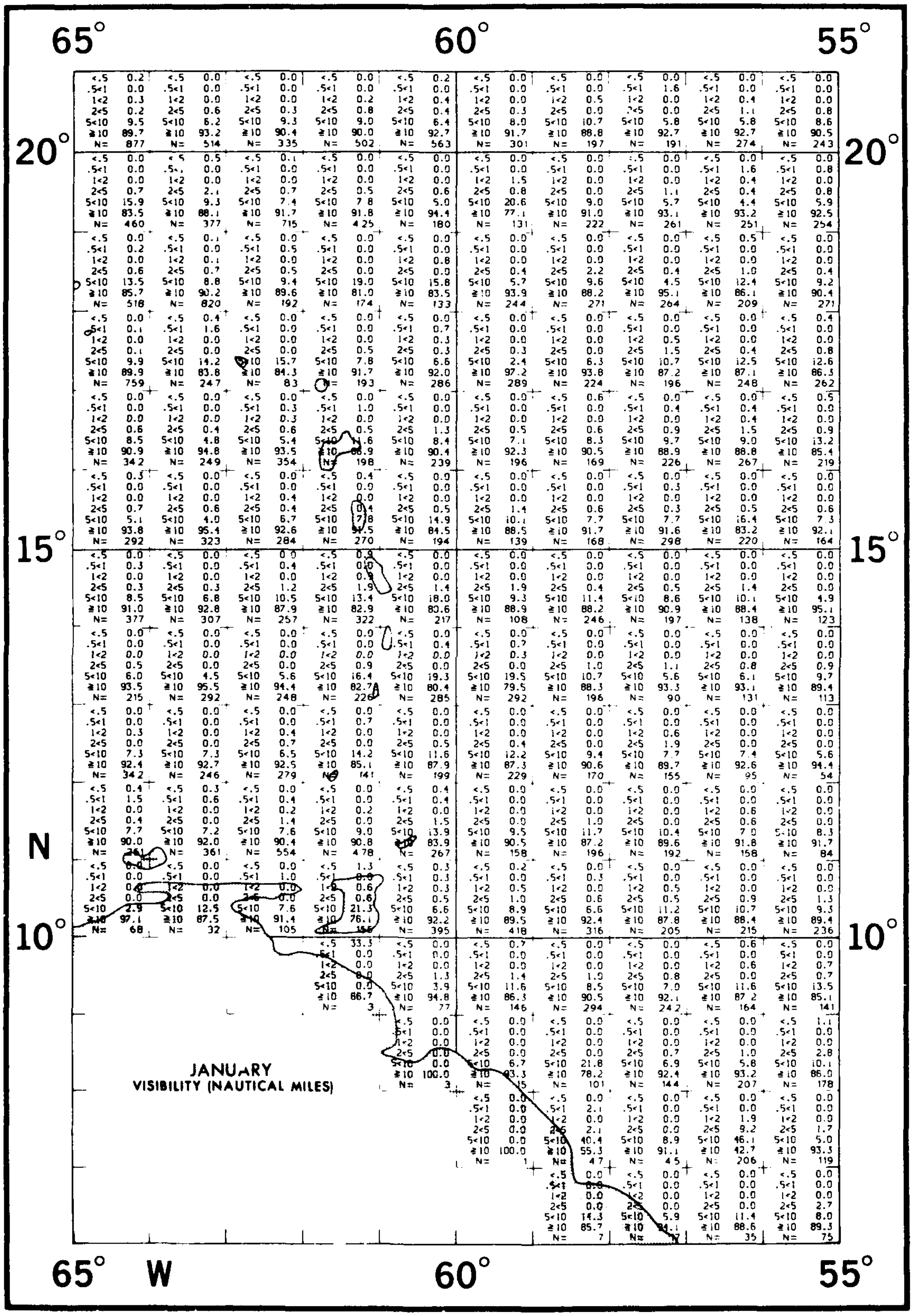
JANUARY
PRECIPITATION
PERCENT FREQUENCY OF
OBSERVATIONS REPORTING PRECIPITATION

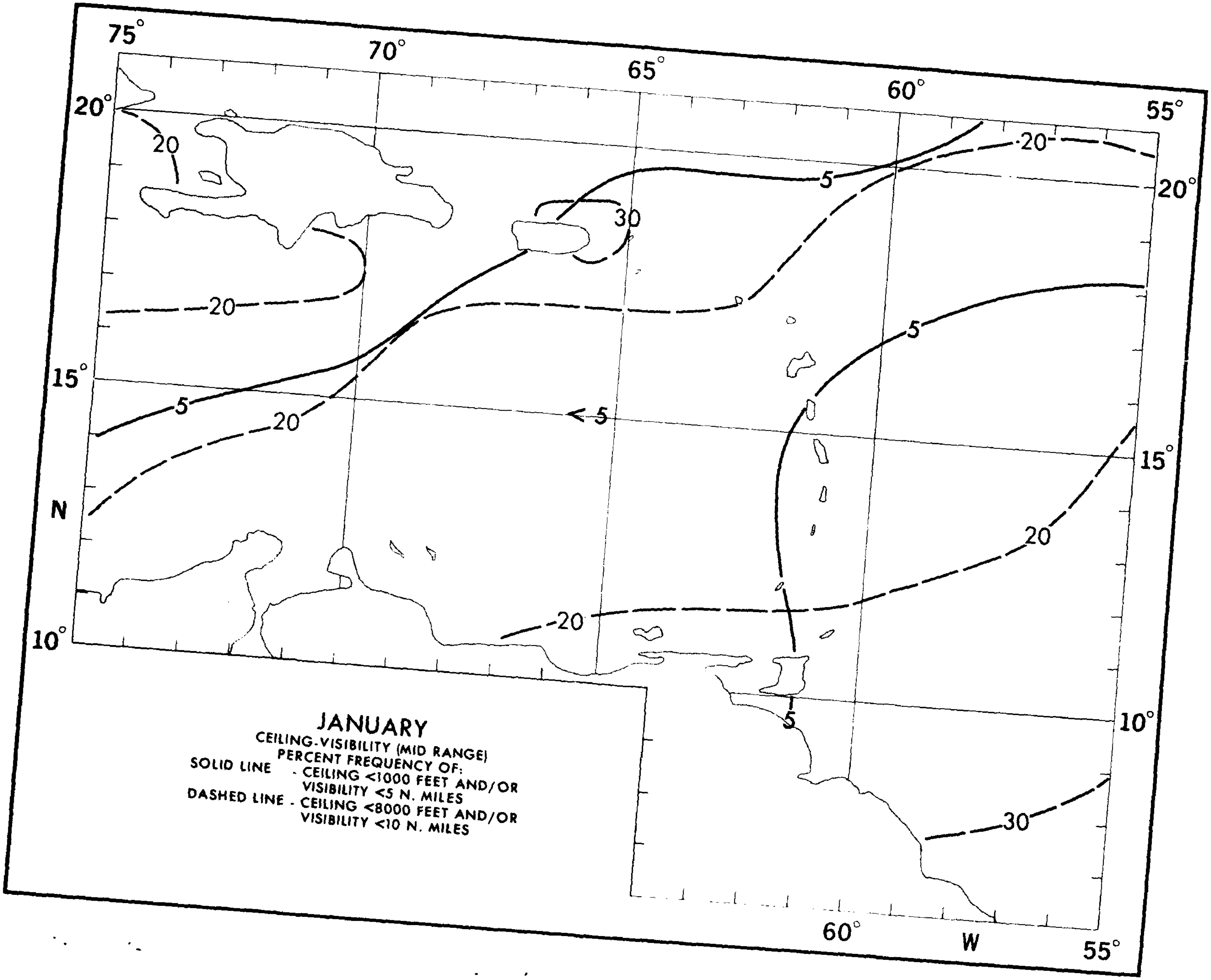


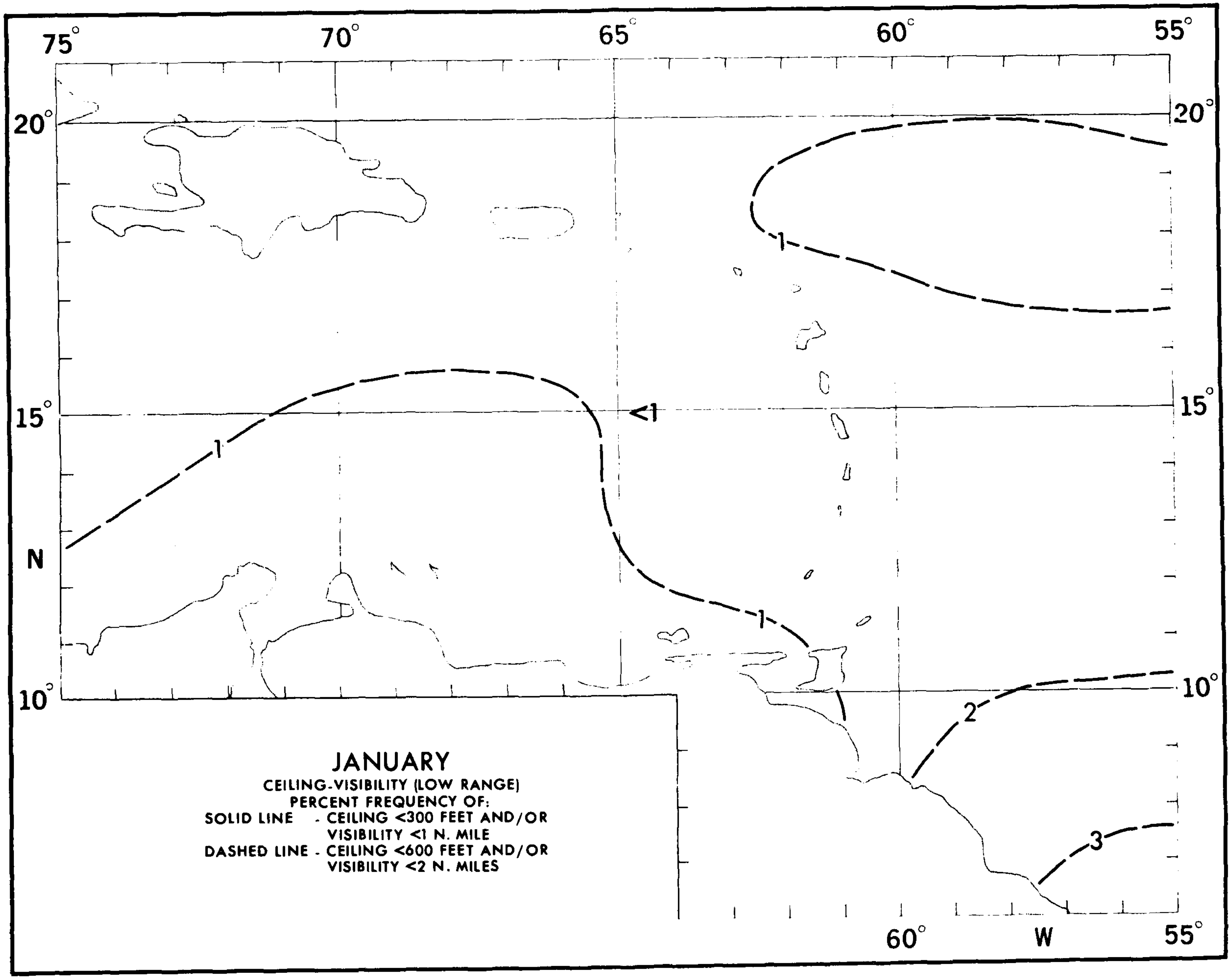
JANUARY

VISIBILITY (NAUTICAL MILES)

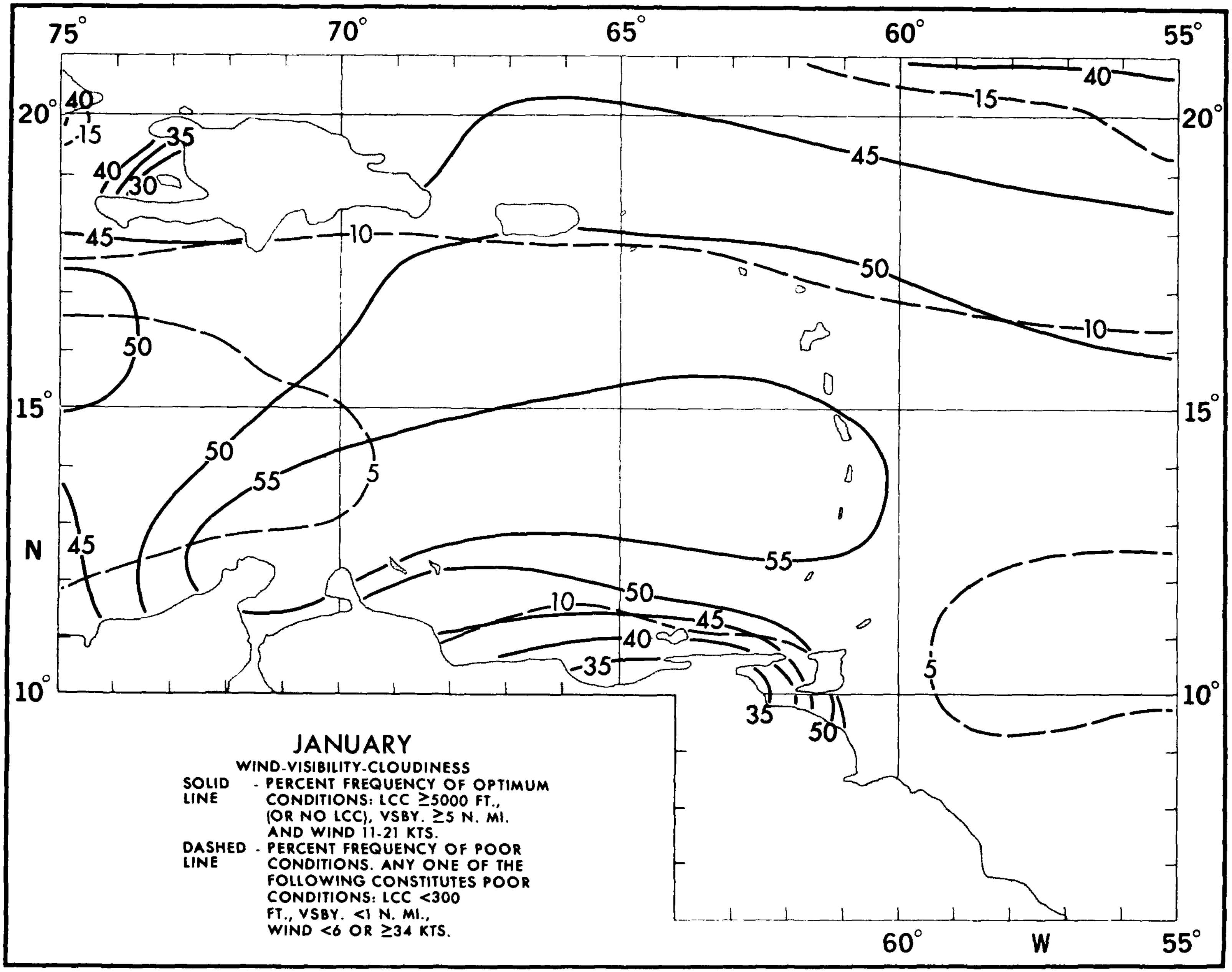
<.5	.2	PERCENT FREQUENCY OF
.5 <1	3.1	VARIOUS RANGES WITHIN ONE-DEGREE QUADRANGLES.
1 <2	6.7	EXAMPLE:
2 <5	10.0	3.1% OF THE OBSERVED VISIBILITIES WERE <1 BUT ≥1/2 N. MILE.
5 <10	60.0	OTHER PERCENTAGES CAN BE SIMILARLY INTERPRETED.
≥10	20.0	N = OBSERVATION COUNT.
N = 1234		


65°
60°
55°
20°
15°
N
10°
65° W
60°
55°
JANUARY
VISIBILITY (NAUTICAL MILES)


JANUARY
CEILING-VISIBILITY (MID RANGE)
PERCENT FREQUENCY OF:
SOLID LINE - CEILING <1000 FEET AND/OR VISIBILITY <5 N. MILES
DASHED LINE - CEILING <8000 FEET AND/OR VISIBILITY <10 N. MILES
75°
70°
65°
60°
55°
20°
15°
10°
N
W
20
5
30
<5



JANUARY
CEILING-VISIBILITY (LOW RANGE)
PERCENT FREQUENCY OF:
SOLID LINE - CEILING <300 FEET AND/OR VISIBILITY <1 N. MILE
DASHED LINE - CEILING <600 FEET AND/OR VISIBILITY <2 N. MILES

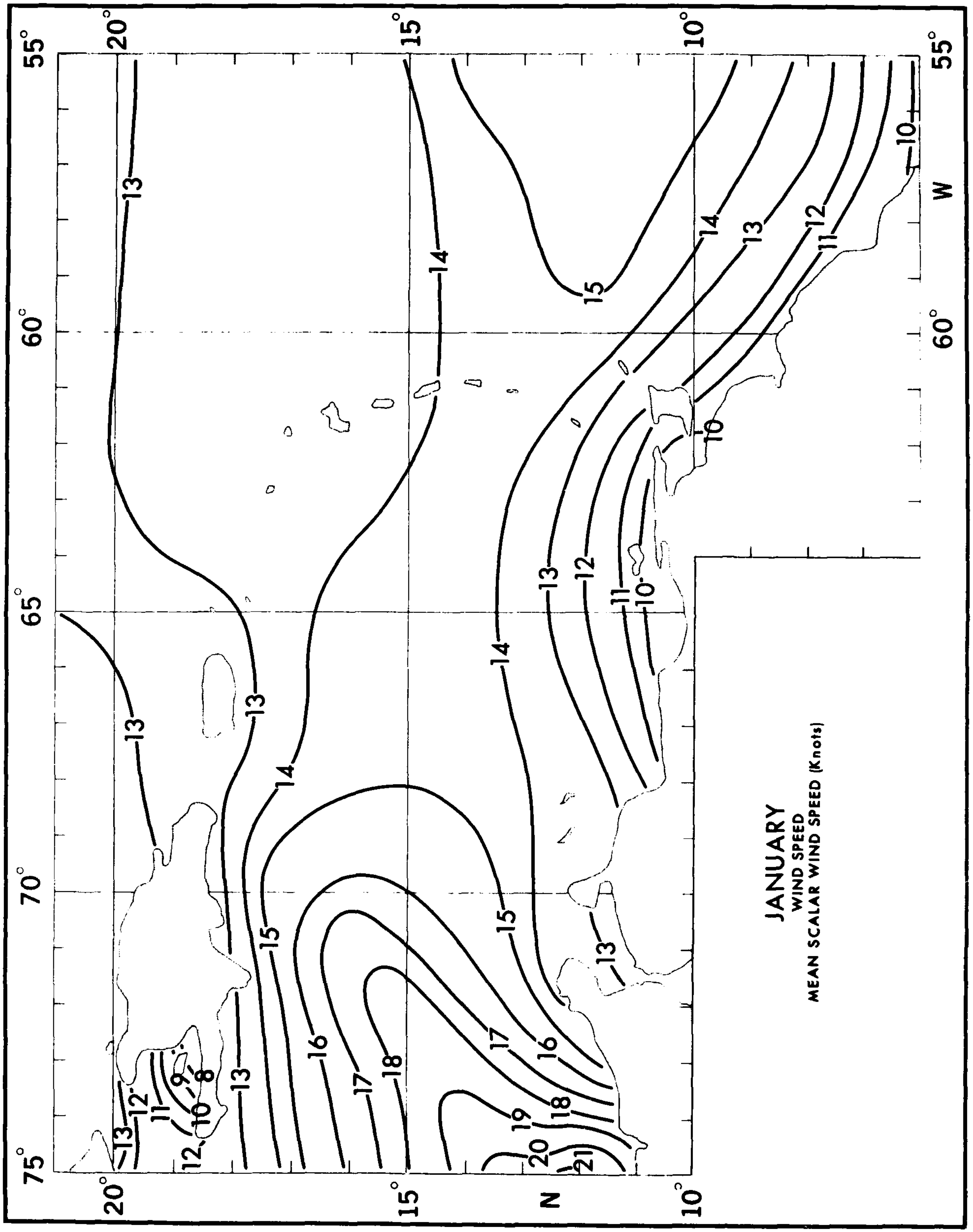


JANUARY

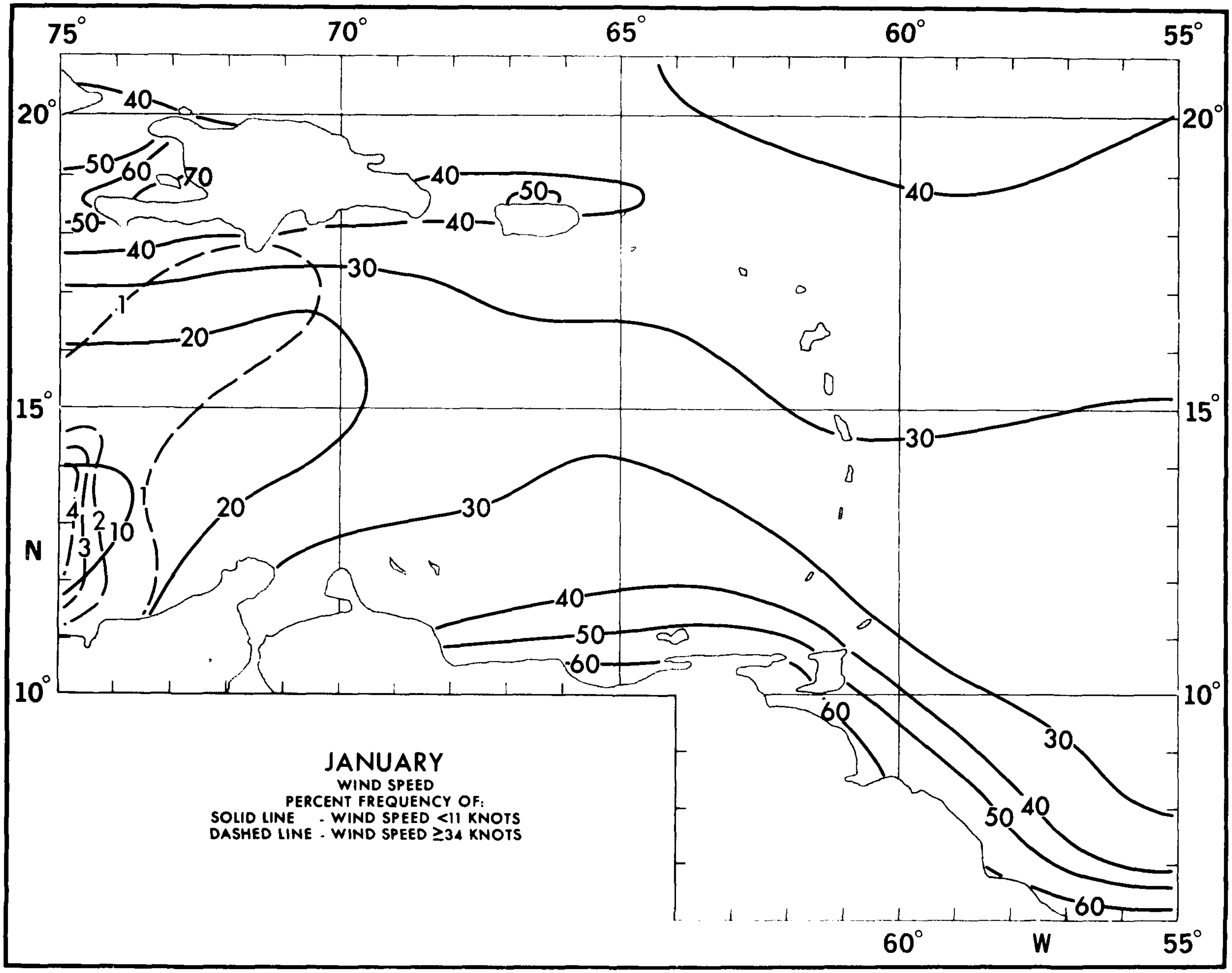
WIND-VISIBILITY-CLOUDINESS

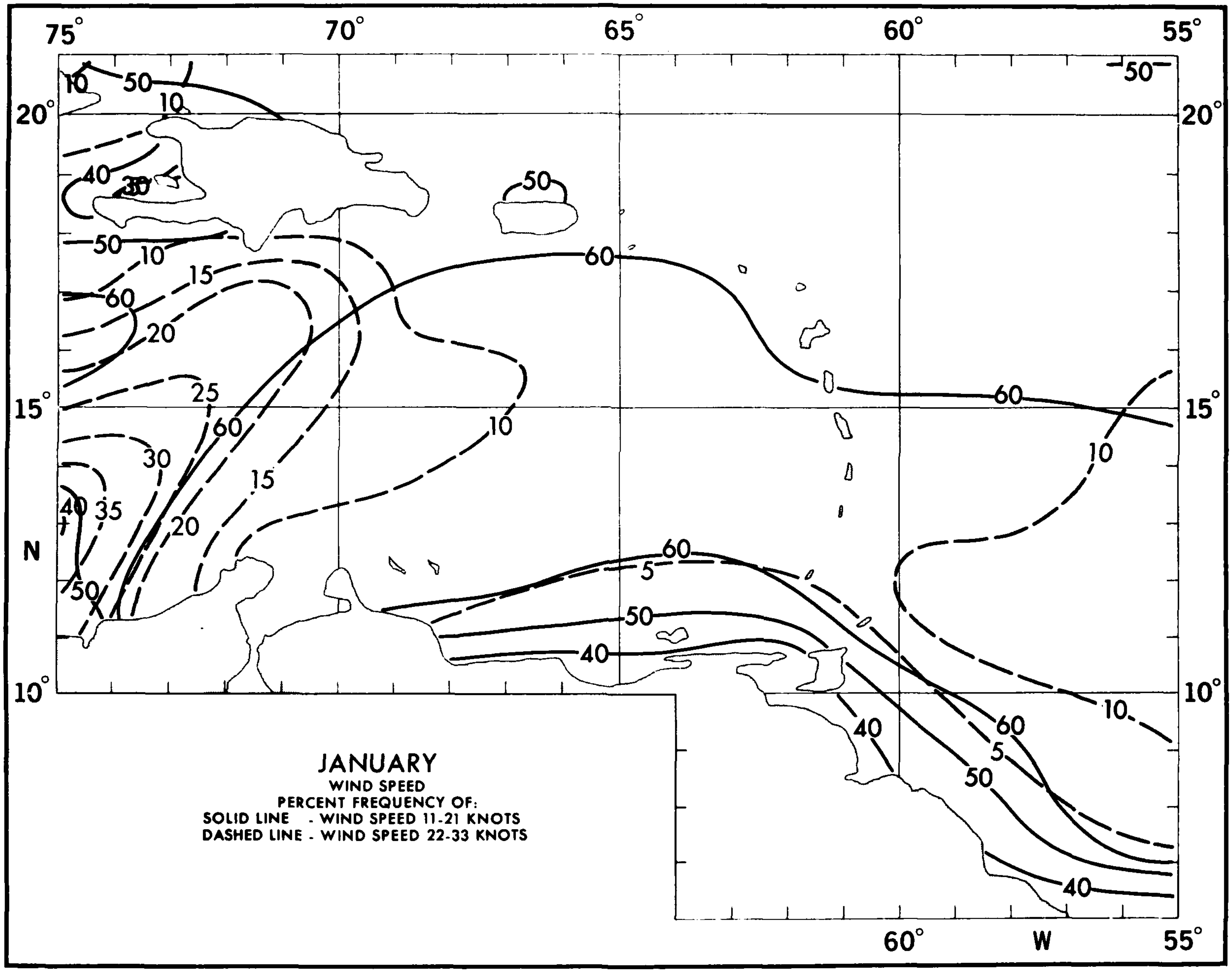
SOLID LINE - PERCENT FREQUENCY OF OPTIMUM CONDITIONS: LCC ≥5000 FT., (OR NO LCC), VSBY. ≥5 N. MI. AND WIND 11-21 KTS.

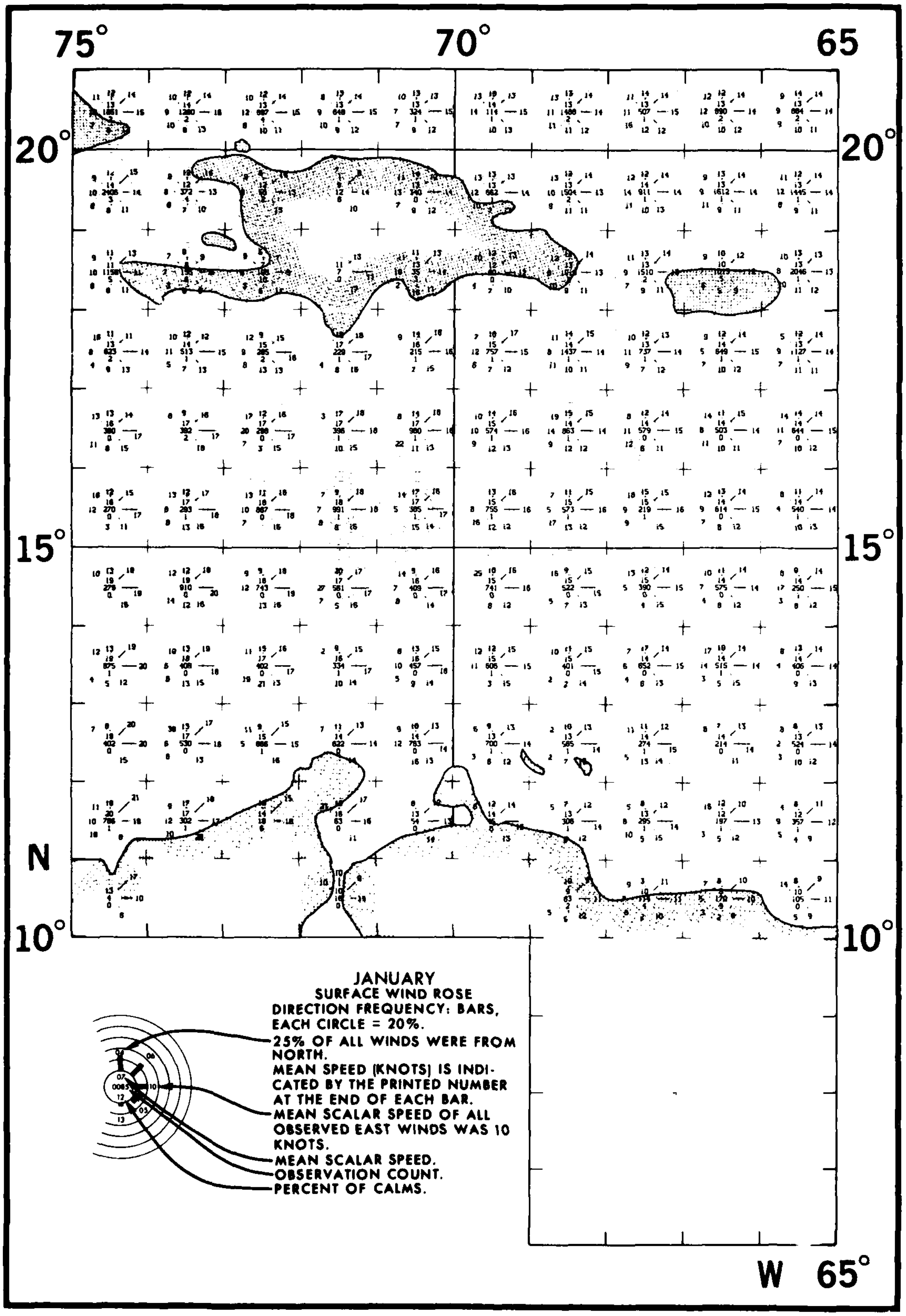
DASHED LINE - PERCENT FREQUENCY OF POOR CONDITIONS. ANY ONE OF THE FOLLOWING CONSTITUTES POOR CONDITIONS: LCC <300 FT., VSBY. <1 N. MI., WIND <6 OR ≥34 KTS.

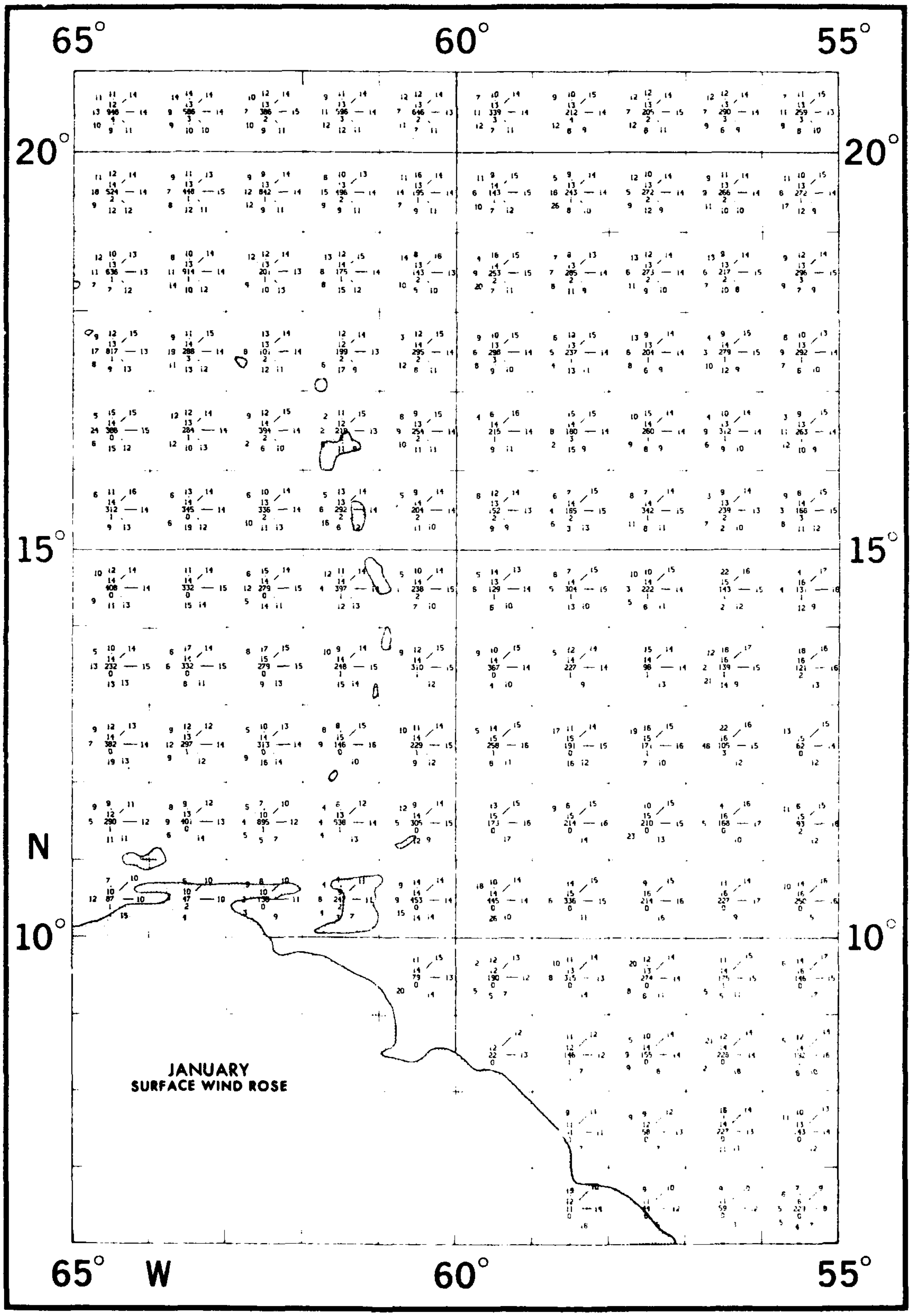


JANUARY
WIND SPEED
MEAN SCALAR WIND SPEED (Knots)


75°
70°
65°
60°
55°
20°
15°
10°
N
W
40
50
60
70
30
20
1
2
3
4
10
JANUARY
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE - WIND SPEED <11 KNOTS
DASHED LINE - WIND SPEED ≥34 KNOTS


75°
70°
65°
60°
55°
20°
15°
10°
N
W
JANUARY
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE - WIND SPEED 11-21 KNOTS
DASHED LINE - WIND SPEED 22-33 KNOTS


75°
70°
65
20°
20°
15°
15°
N
10°
10°
W 65°
JANUARY
SURFACE WIND ROSE
DIRECTION FREQUENCY: BARS, EACH CIRCLE = 20%.
25% OF ALL WINDS WERE FROM NORTH.
MEAN SPEED (KNOTS) IS INDICATED BY THE PRINTED NUMBER AT THE END OF EACH BAR.
MEAN SCALAR SPEED OF ALL OBSERVED EAST WINDS WAS 10 KNOTS.
MEAN SCALAR SPEED.
OBSERVATION COUNT.
PERCENT OF CALMS.


65°
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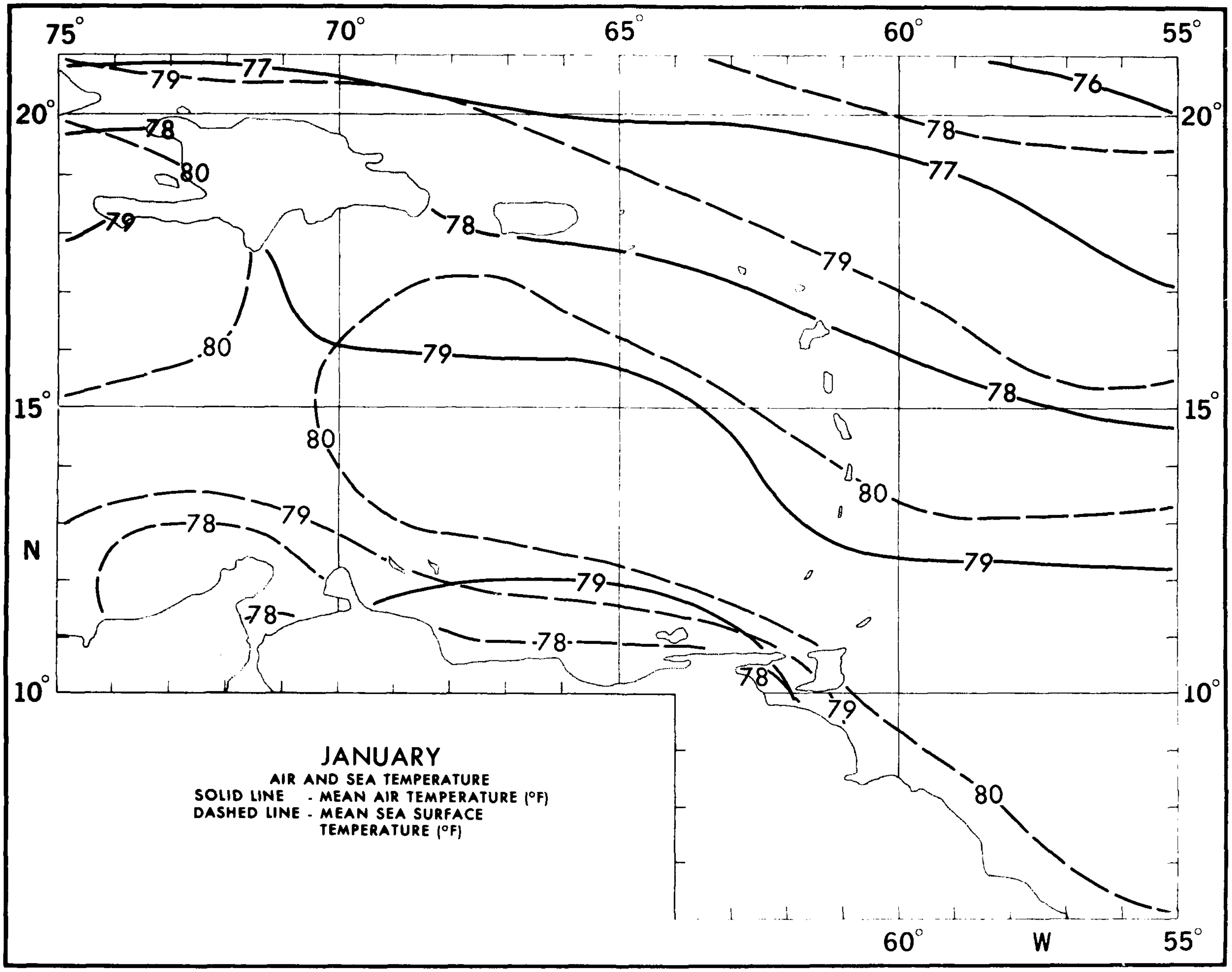
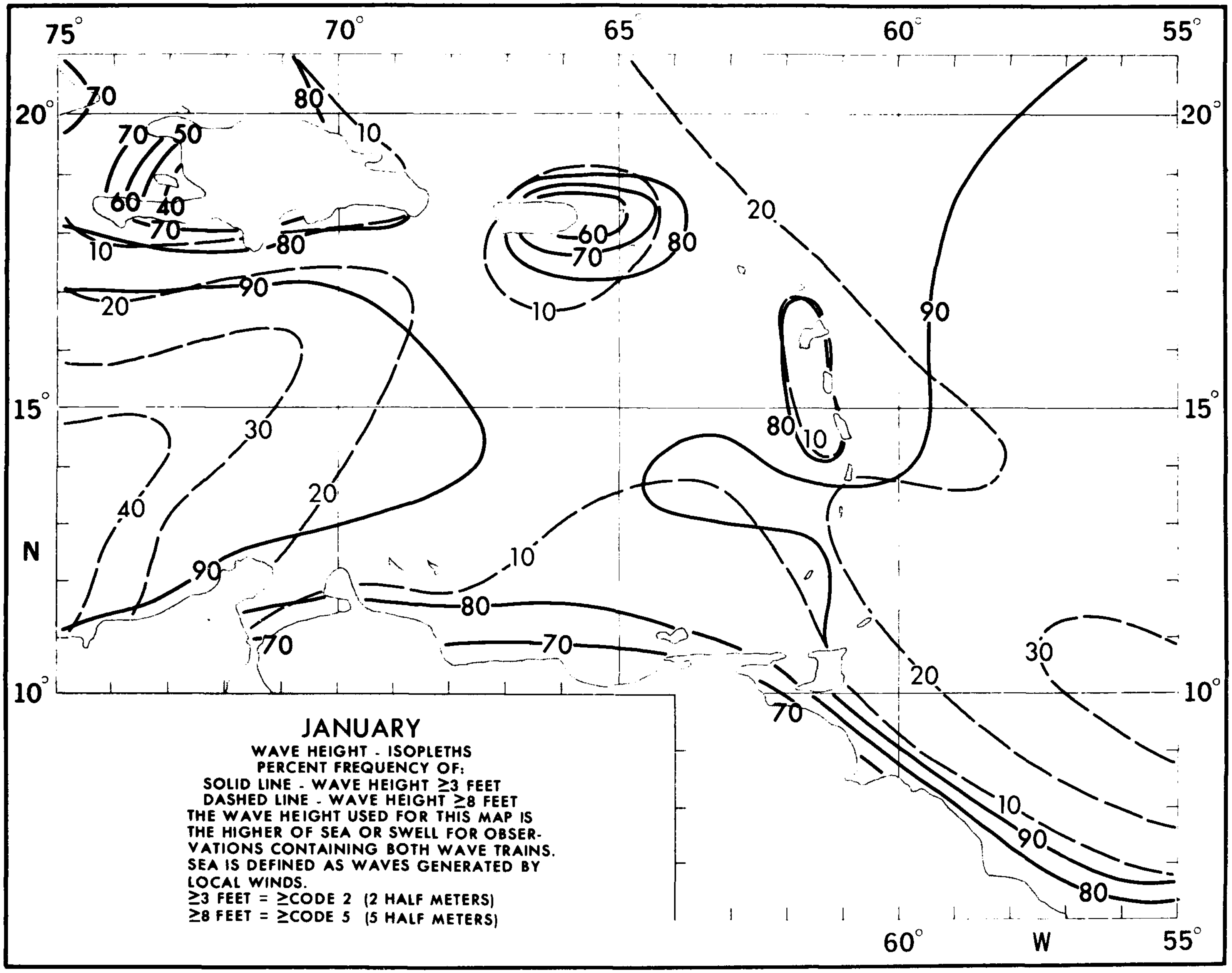
55°
20°
15°
10°
N
W
JANUARY
SURFACE WIND ROSE

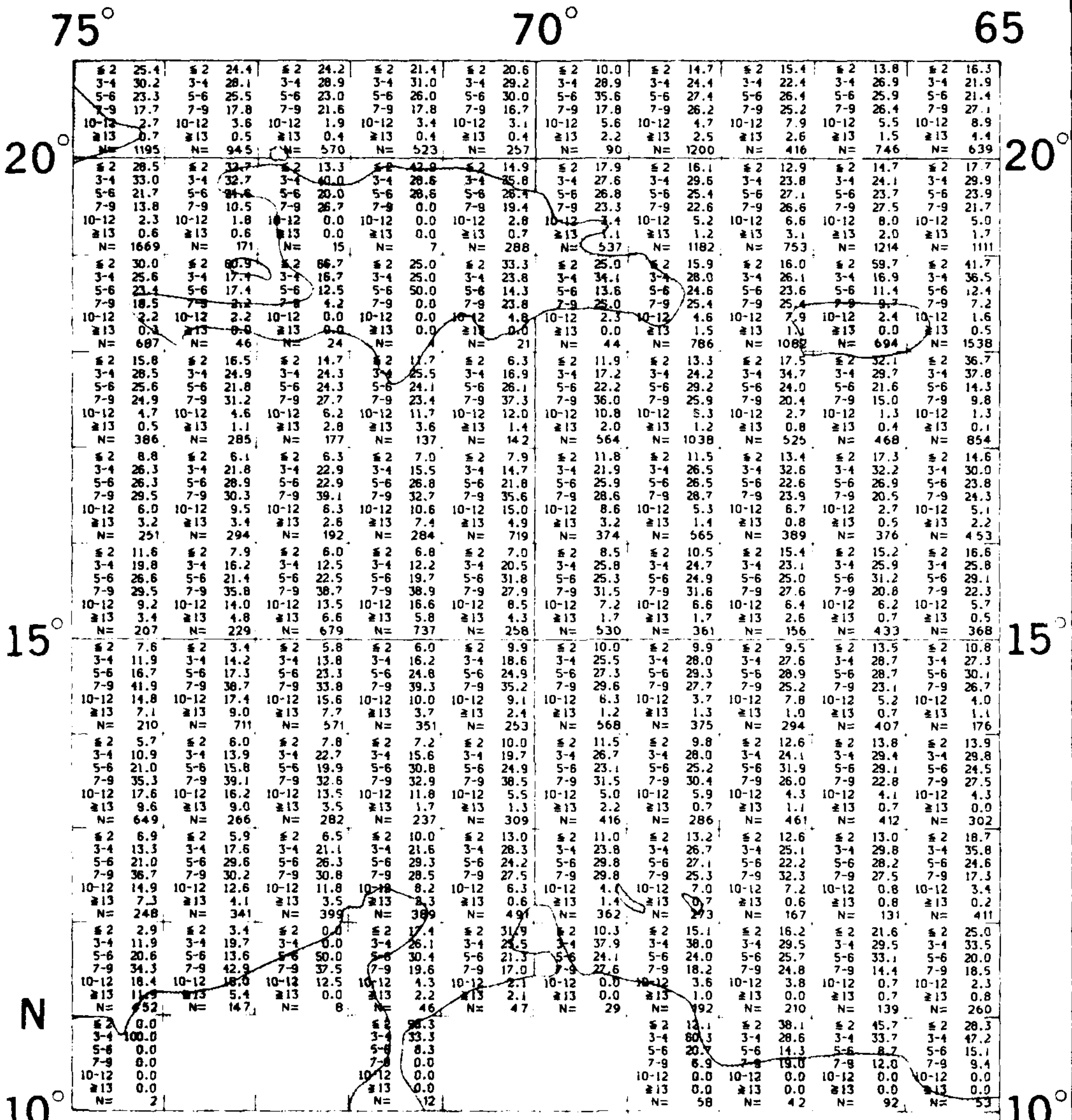


JANUARY
AIR AND SEA TEMPERATURE
SOLID LINE - MEAN AIR TEMPERATURE (°F)
DASHED LINE - MEAN SEA SURFACE TEMPERATURE (°F)



JANUARY

WAVE HEIGHT - ISOPLETHS
PERCENT FREQUENCY OF:
SOLID LINE - WAVE HEIGHT ≥3 FEET
DASHED LINE - WAVE HEIGHT ≥8 FEET
THE WAVE HEIGHT USED FOR THIS MAP IS THE HIGHER OF SEA OR SWELL FOR OBSERVATIONS CONTAINING BOTH WAVE TRAINS.
SEA IS DEFINED AS WAVES GENERATED BY LOCAL WINDS.
≥3 FEET = ≥CODE 2 (2 HALF METERS)
≥8 FEET = ≥CODE 5 (5 HALF METERS)

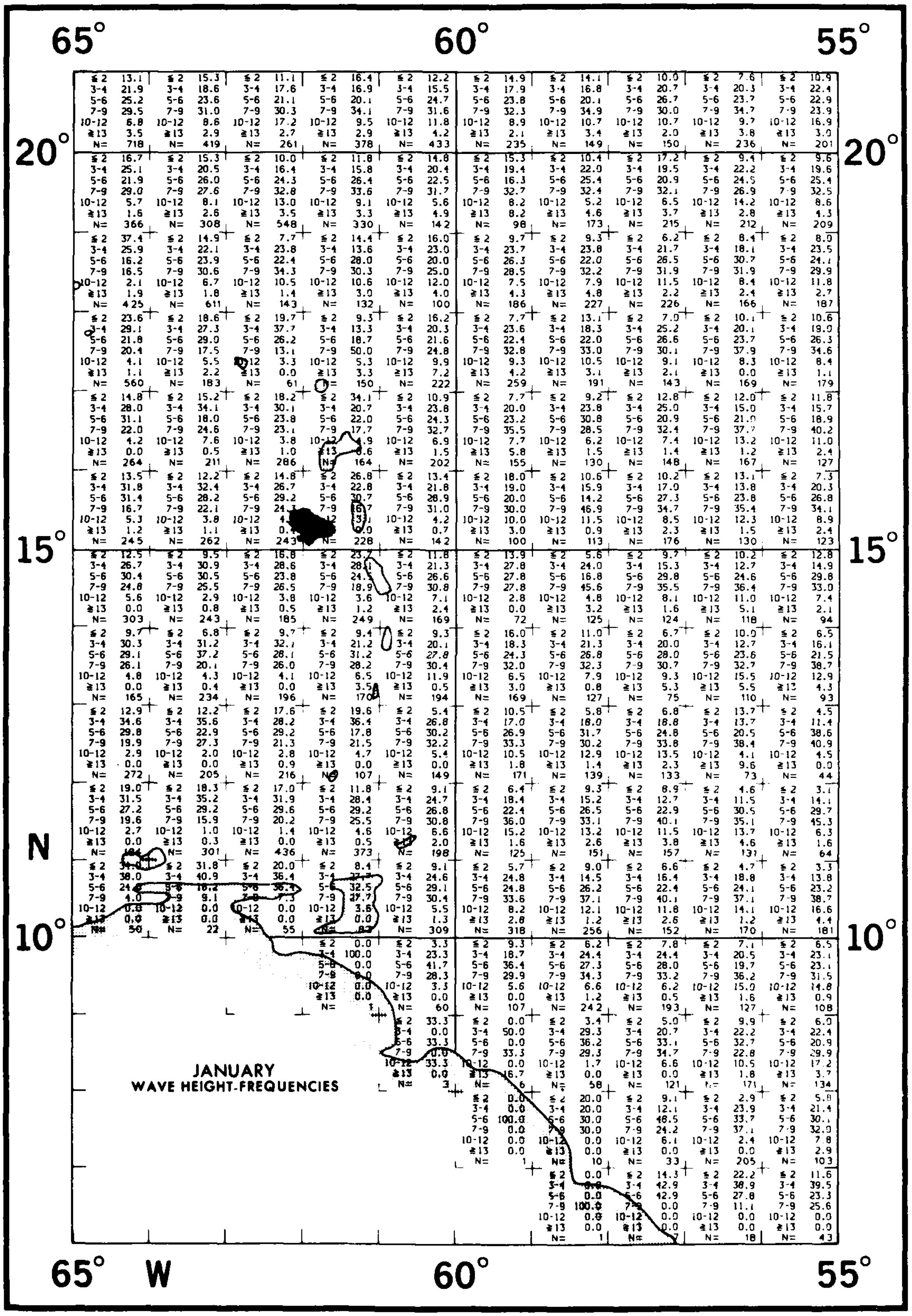


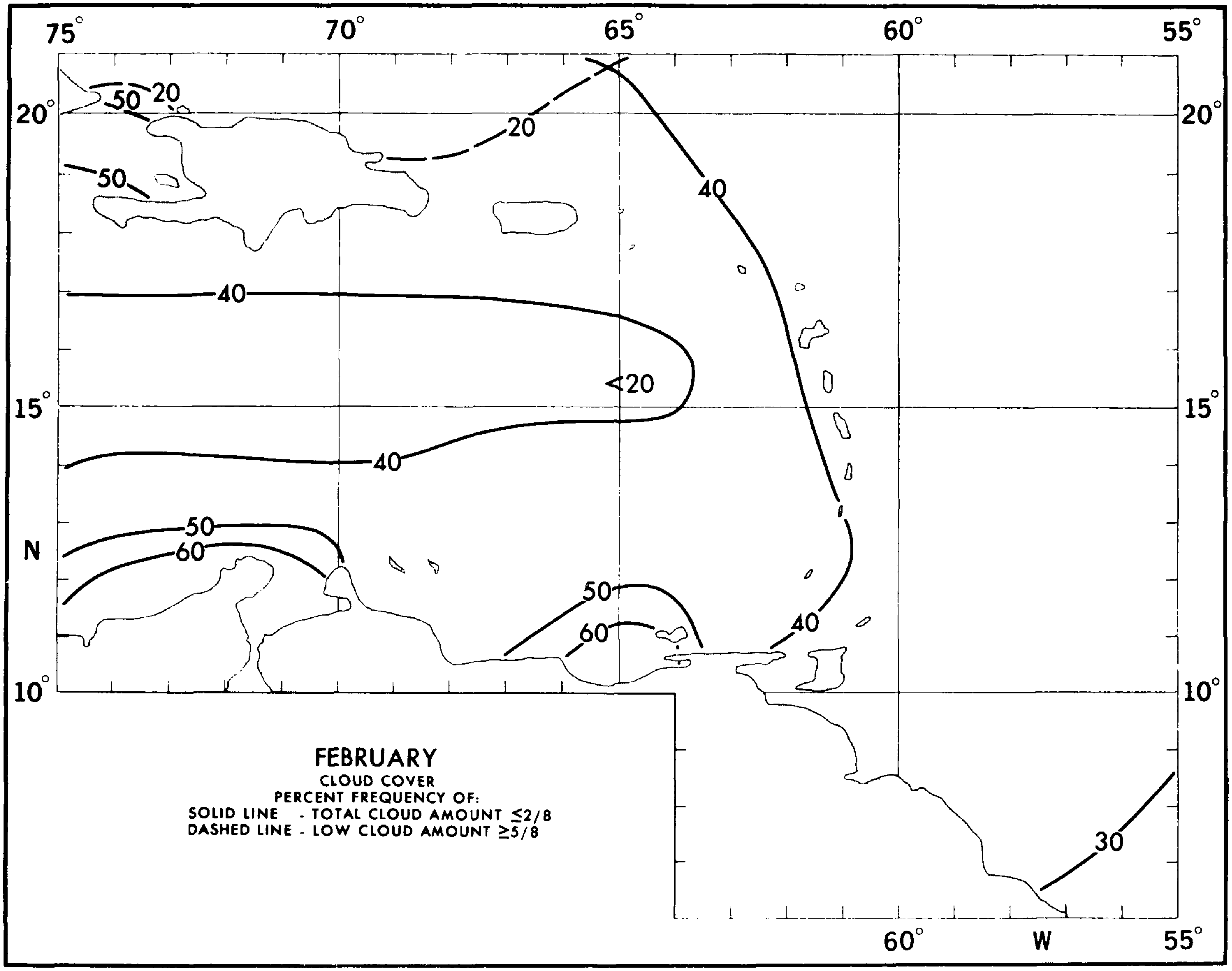
JANUARY

WAVE HEIGHT-FREQUENCIES

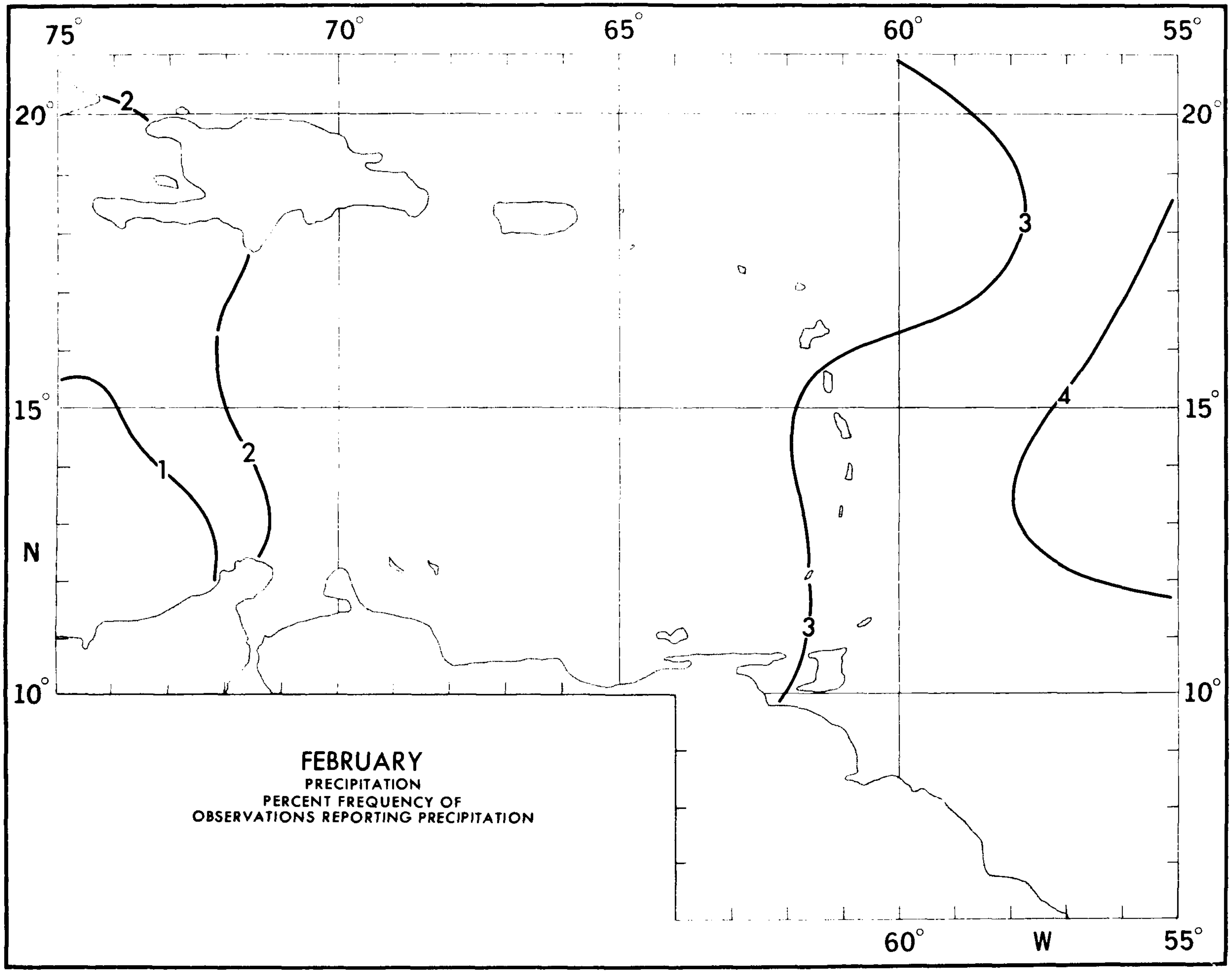
≤2	10.0	PERCENT FREQUENCY OF
3-4	20.0	VARIOUS RANGES WITHIN ONE-
5-6	30.0	DEGREE QUADRANGLES.
7-9	20.0	EXAMPLE:
10-12	10.0	30.0% OF ALL OBSERVED WAVE
≥13	10.0	HEIGHTS WERE IN THE RANGE 5
N =	1363	TO 6 FEET.

N = OBSERVATION COUNT.
WAVE DATA FOR THESE TABLES WERE SELECTED FROM THE HIGHER OF SEA OR SWELL WHEN BOTH WERE REPORTED.

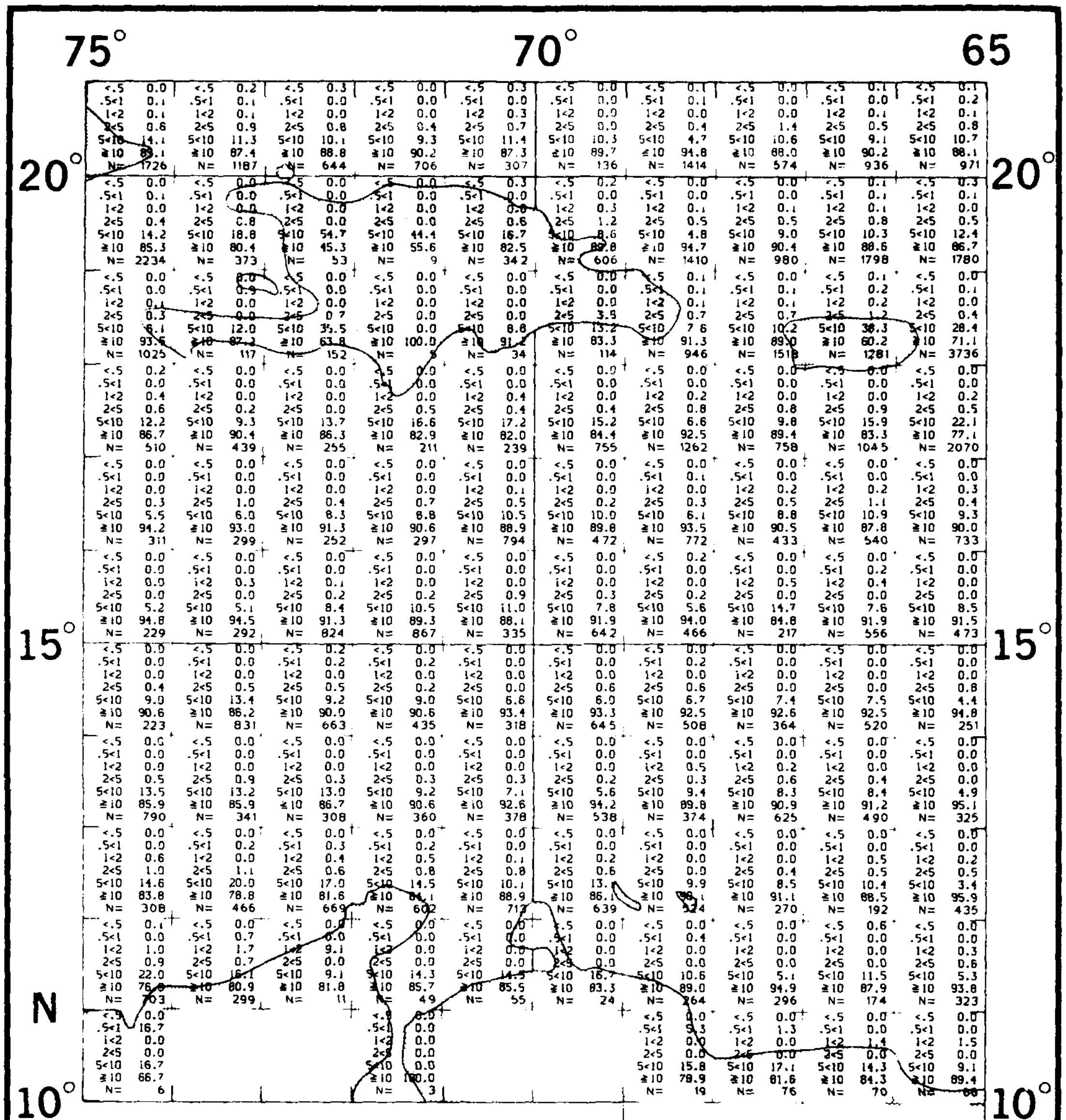

65°
60°
55°
20°
15°
10°
N
65° W
JANUARY
WAVE HEIGHT-FREQUENCIES



FEBRUARY
CLOUD COVER
PERCENT FREQUENCY OF:
SOLID LINE - TOTAL CLOUD AMOUNT ≤2/8
DASHED LINE - LOW CLOUD AMOUNT ≥5/8



FEBRUARY
PRECIPITATION
PERCENT FREQUENCY OF
OBSERVATIONS REPORTING PRECIPITATION

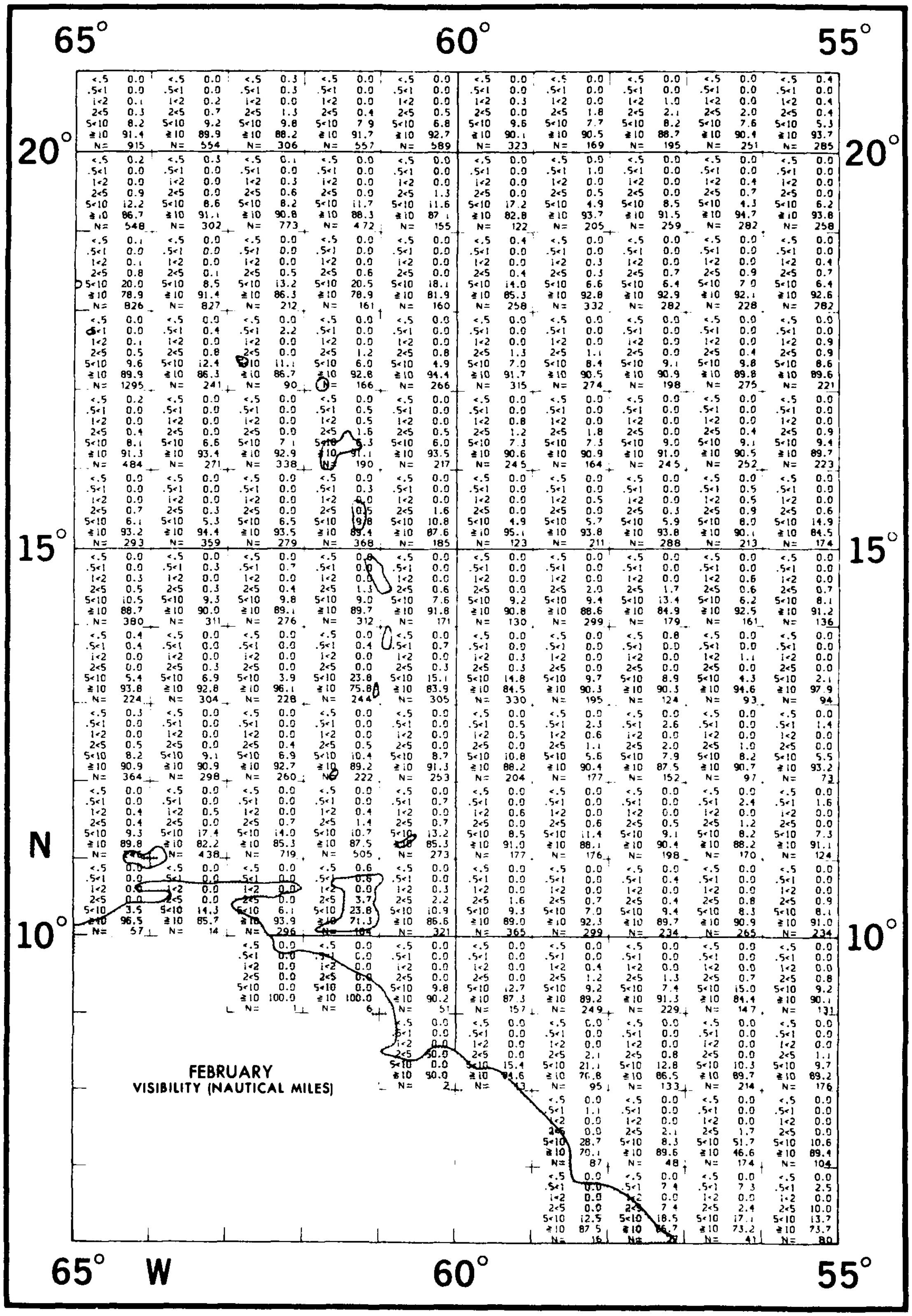


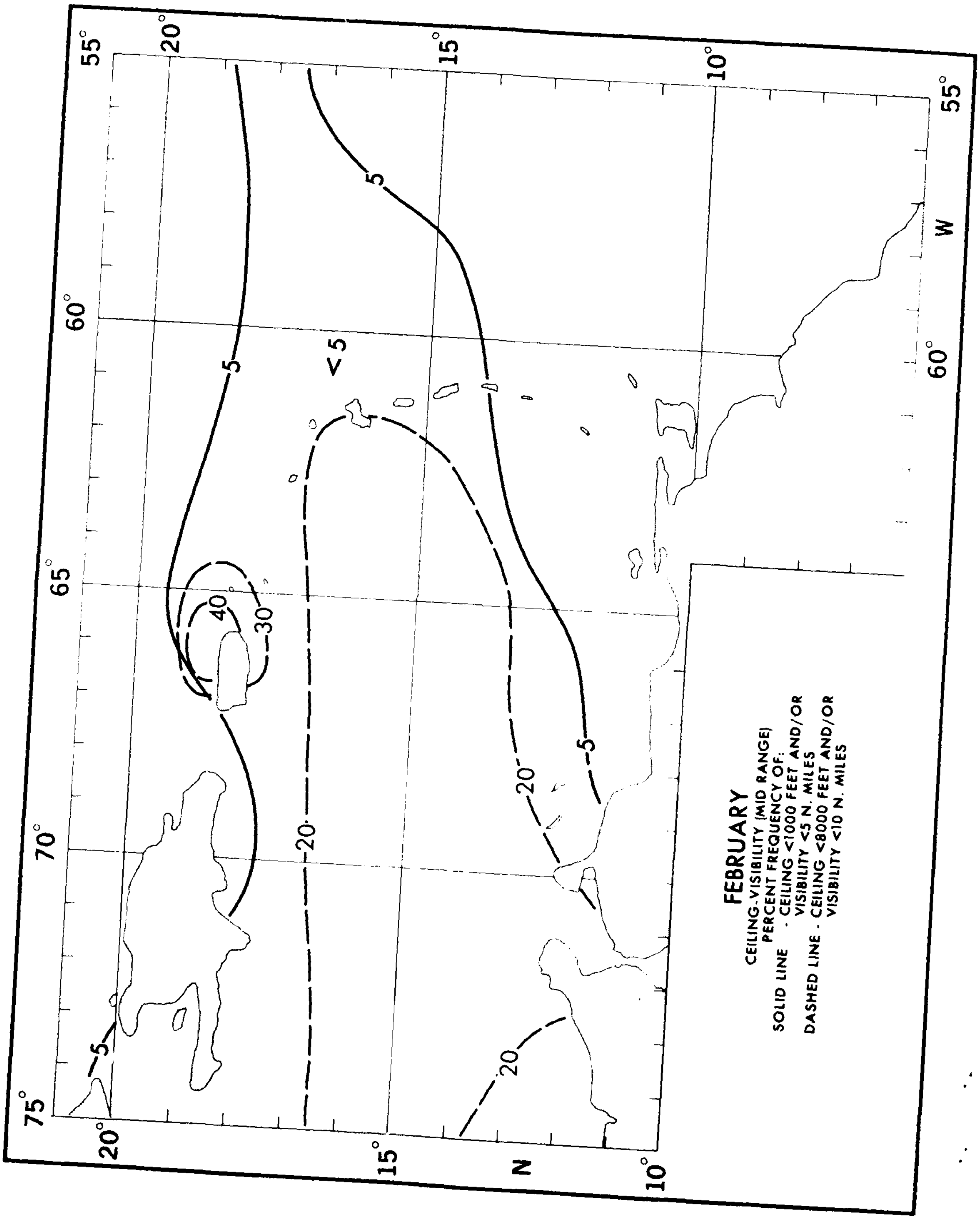
FEBRUARY

VISIBILITY (NAUTICAL MILES)

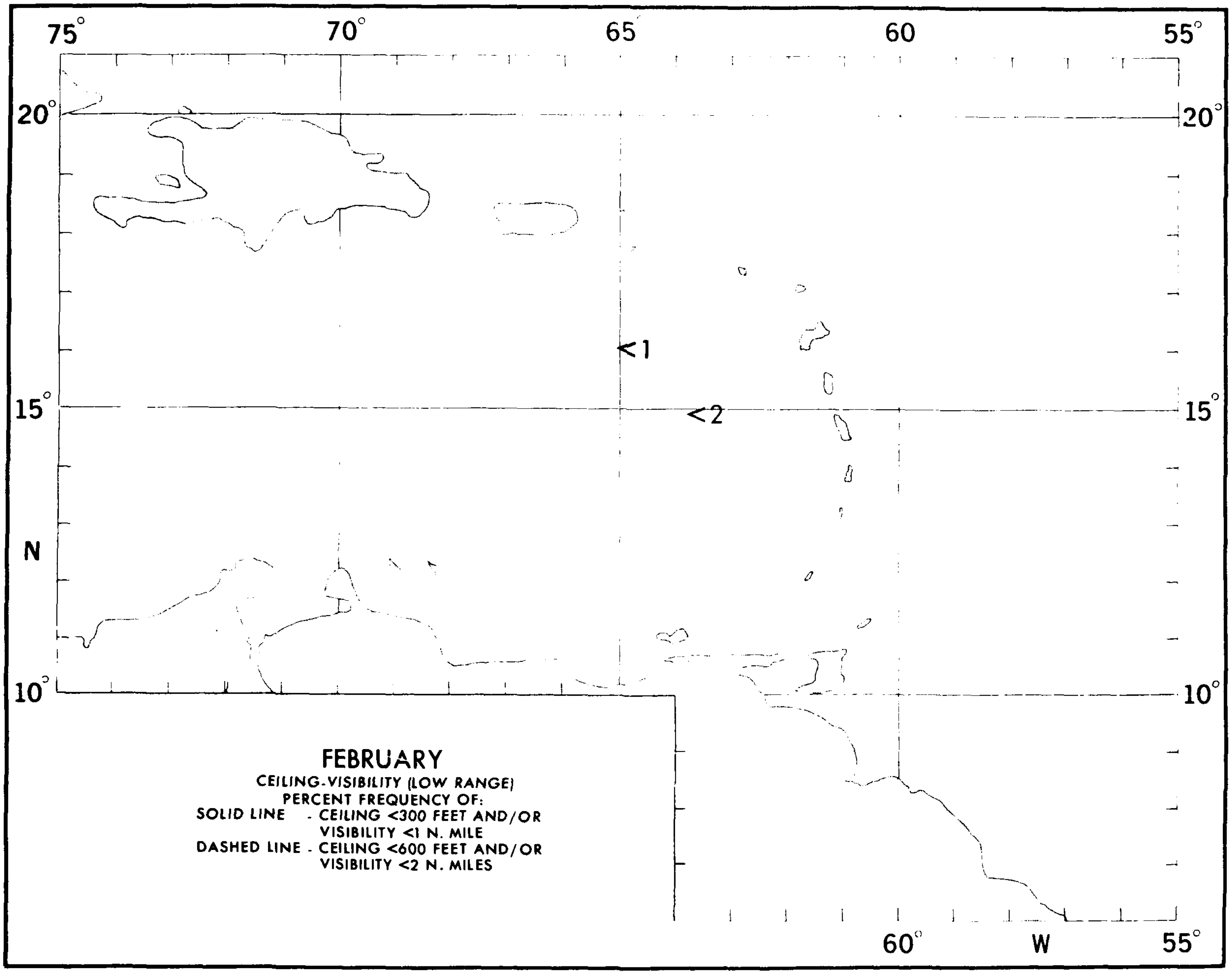
<.5	.2	PERCENT FREQUENCY OF
.5 <1	3.1	VARIOUS RANGES WITHIN ONE-
1 <2	6.7	DEGREE QUADRANGLES.
2 <5	10.0	EXAMPLE:
5 <10	60.0	3.1% OF THE OBSERVED VISIBILITIES WERE <1 BUT ≥1/2 N. MILE.
≥10	20.0	OTHER PERCENTAGES CAN BE SIMILARLY INTERPRETED.
N = 1234		N = OBSERVATION COUNT.

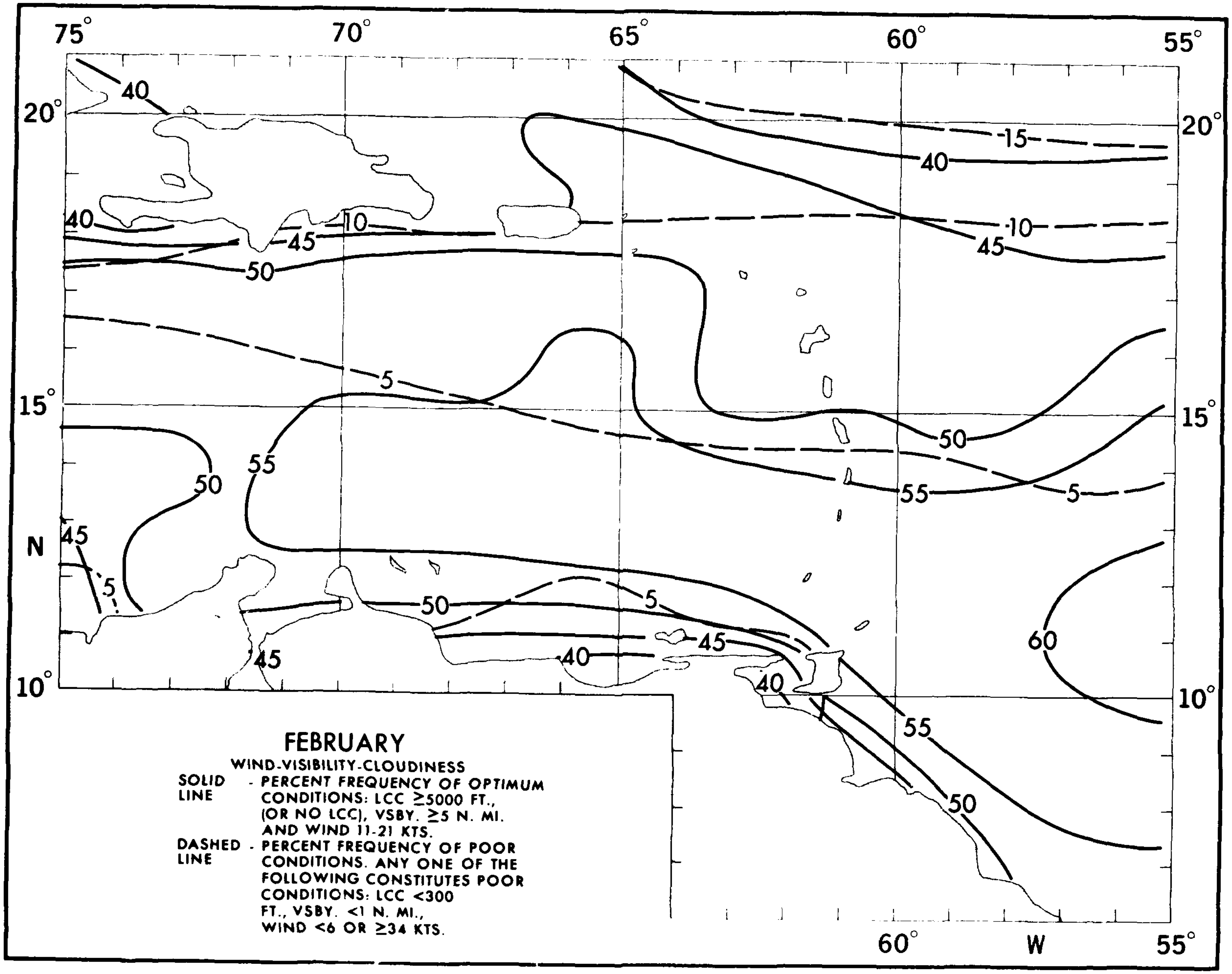
W 65°


65° 60° 55°
20° 20°
15° 15°
N
10° 10°
FEBRUARY
VISIBILITY (NAUTICAL MILES)
65° W 60° 55°



FEBRUARY
CEILING-VISIBILITY (MID RANGE)
PERCENT FREQUENCY OF:
SOLID LINE · CEILING <1000 FEET AND/OR
VISIBILITY <5 N. MILES
DASHED LINE · CEILING <8000 FEET AND/OR
VISIBILITY <10 N. MILES


75°
70°
65°
60
55°
20°
15°
10°
N
W
60°
55°
<1
<2
FEBRUARY
CEILING-VISIBILITY (LOW RANGE)
PERCENT FREQUENCY OF:
SOLID LINE - CEILING <300 FEET AND/OR VISIBILITY <1 N. MILE
DASHED LINE - CEILING <600 FEET AND/OR VISIBILITY <2 N. MILES


75°
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20°
15°
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N
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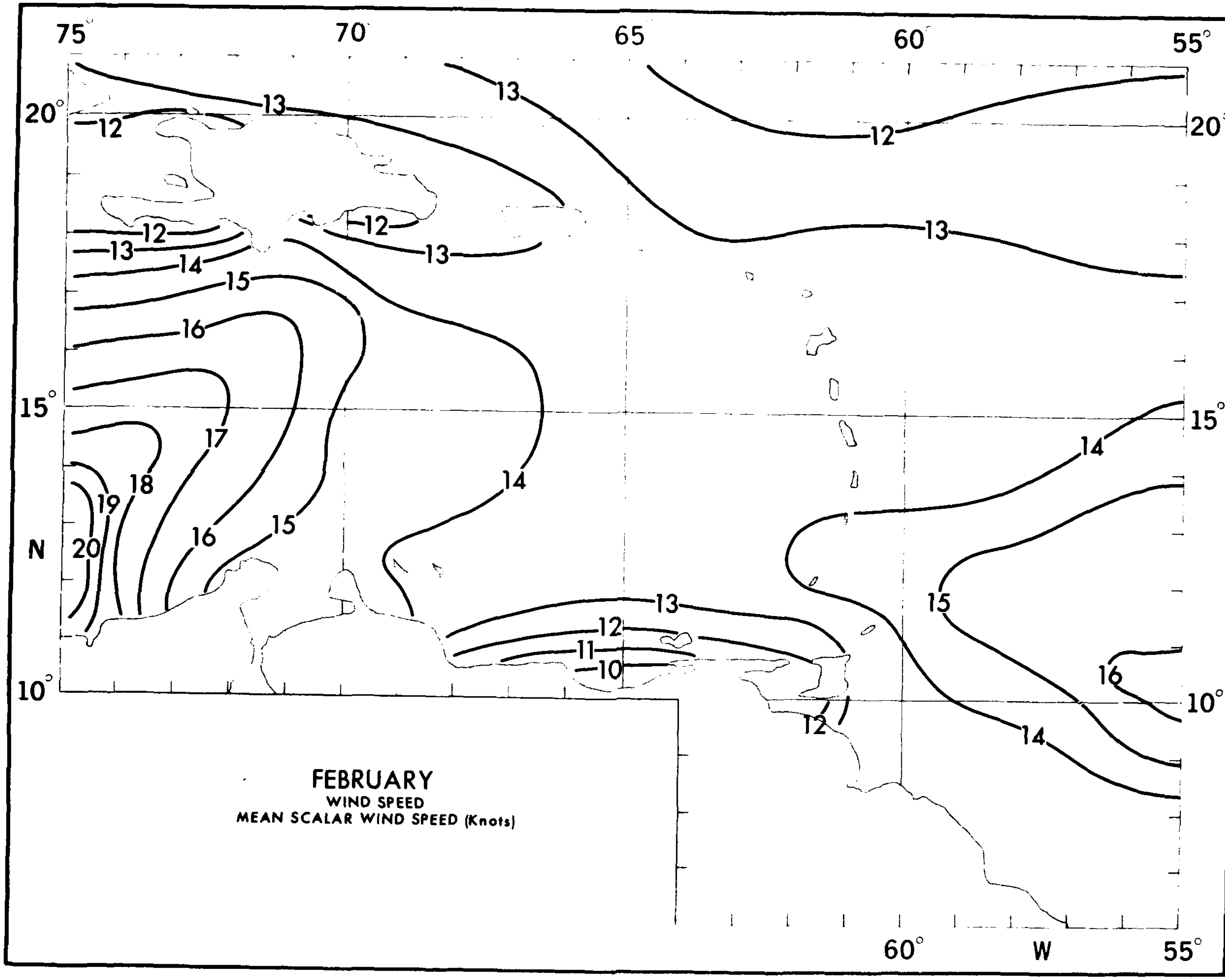
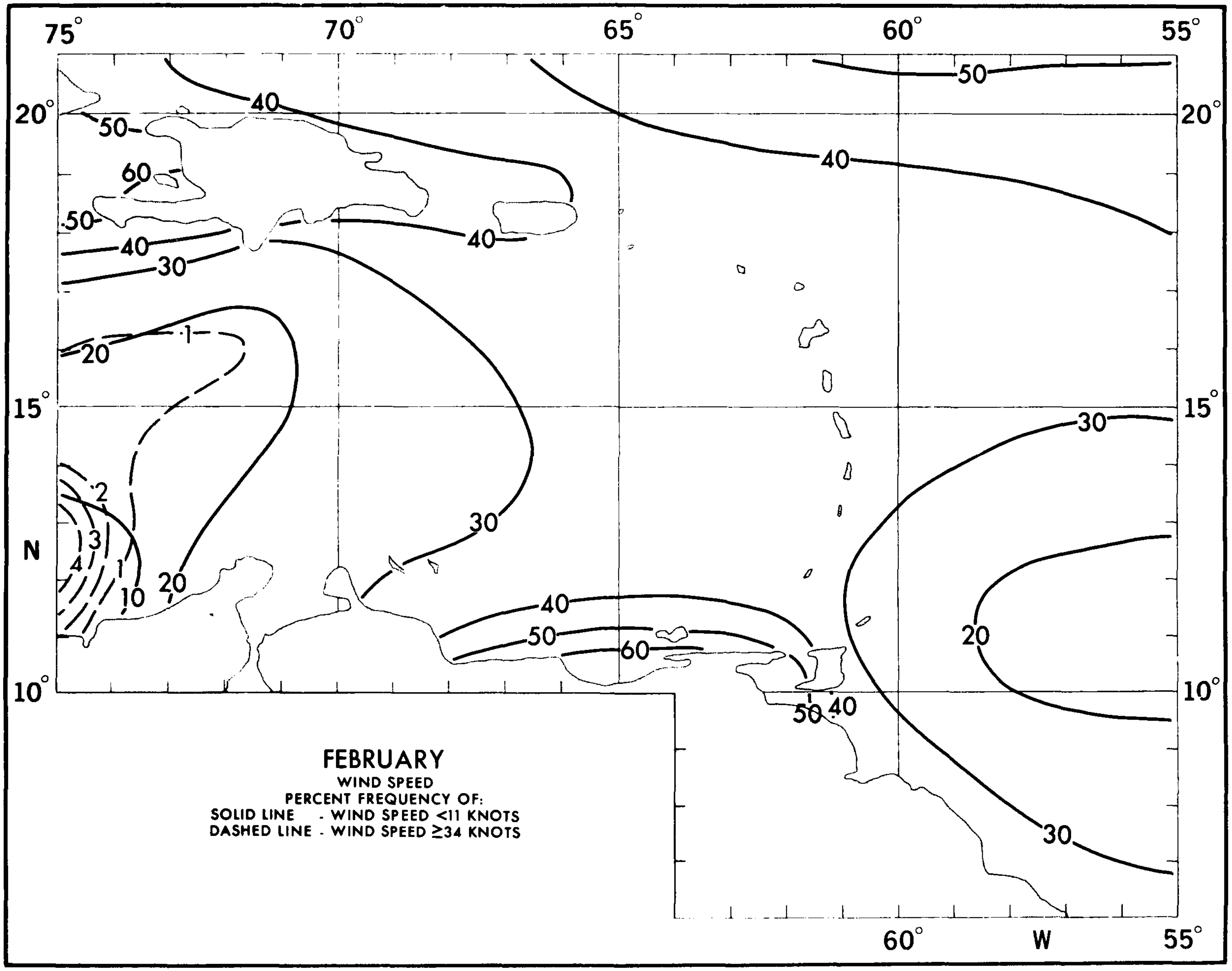
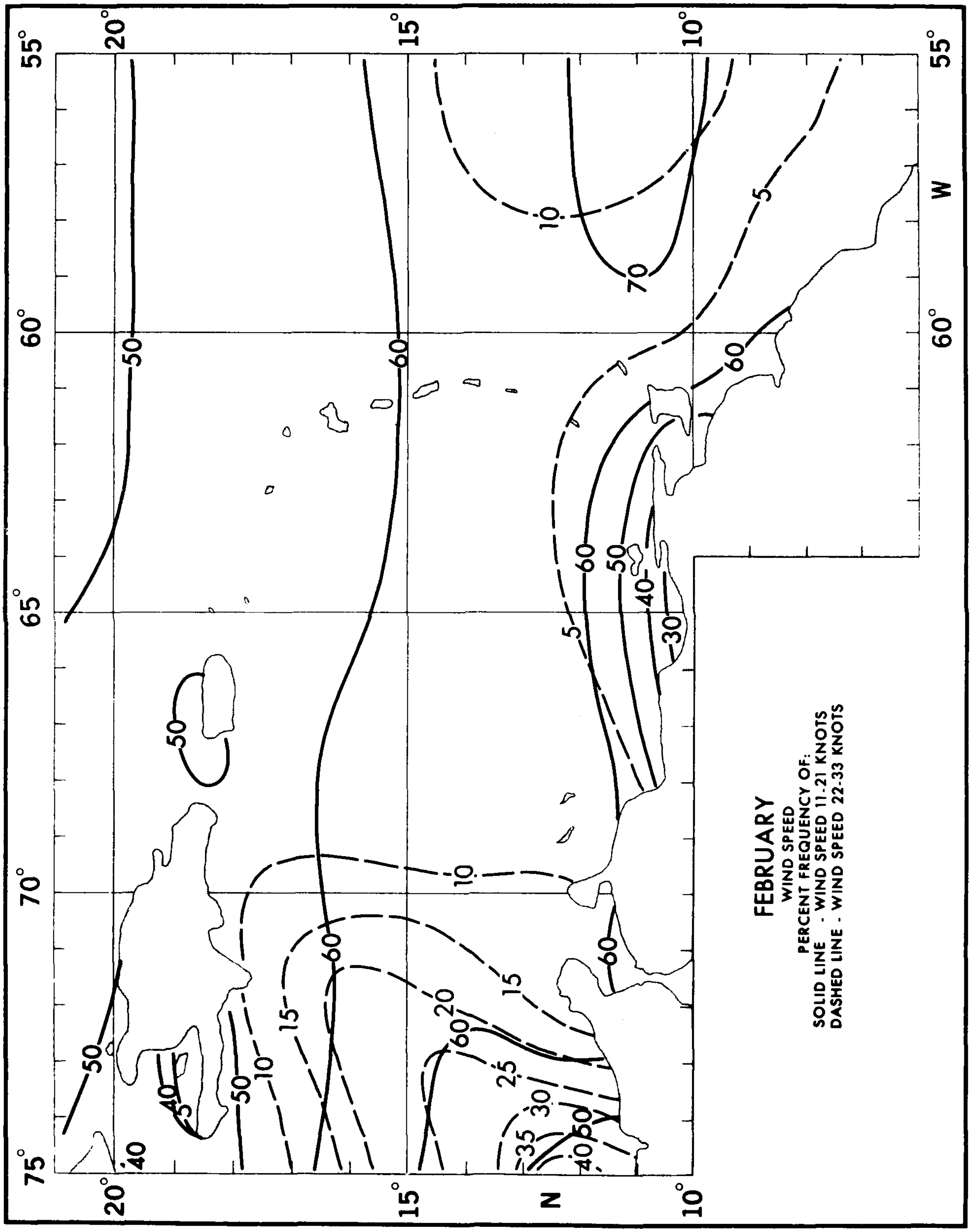
40
45
50
55
60
5
10
15
FEBRUARY
WIND-VISIBILITY-CLOUDINESS
SOLID LINE - PERCENT FREQUENCY OF OPTIMUM CONDITIONS: LCC ≥5000 FT., (OR NO LCC), VSBY. ≥5 N. MI. AND WIND 11-21 KTS.
DASHED LINE - PERCENT FREQUENCY OF POOR CONDITIONS. ANY ONE OF THE FOLLOWING CONSTITUTES POOR CONDITIONS: LCC <300 FT., VSBY. <1 N. MI., WIND <6 OR ≥34 KTS.

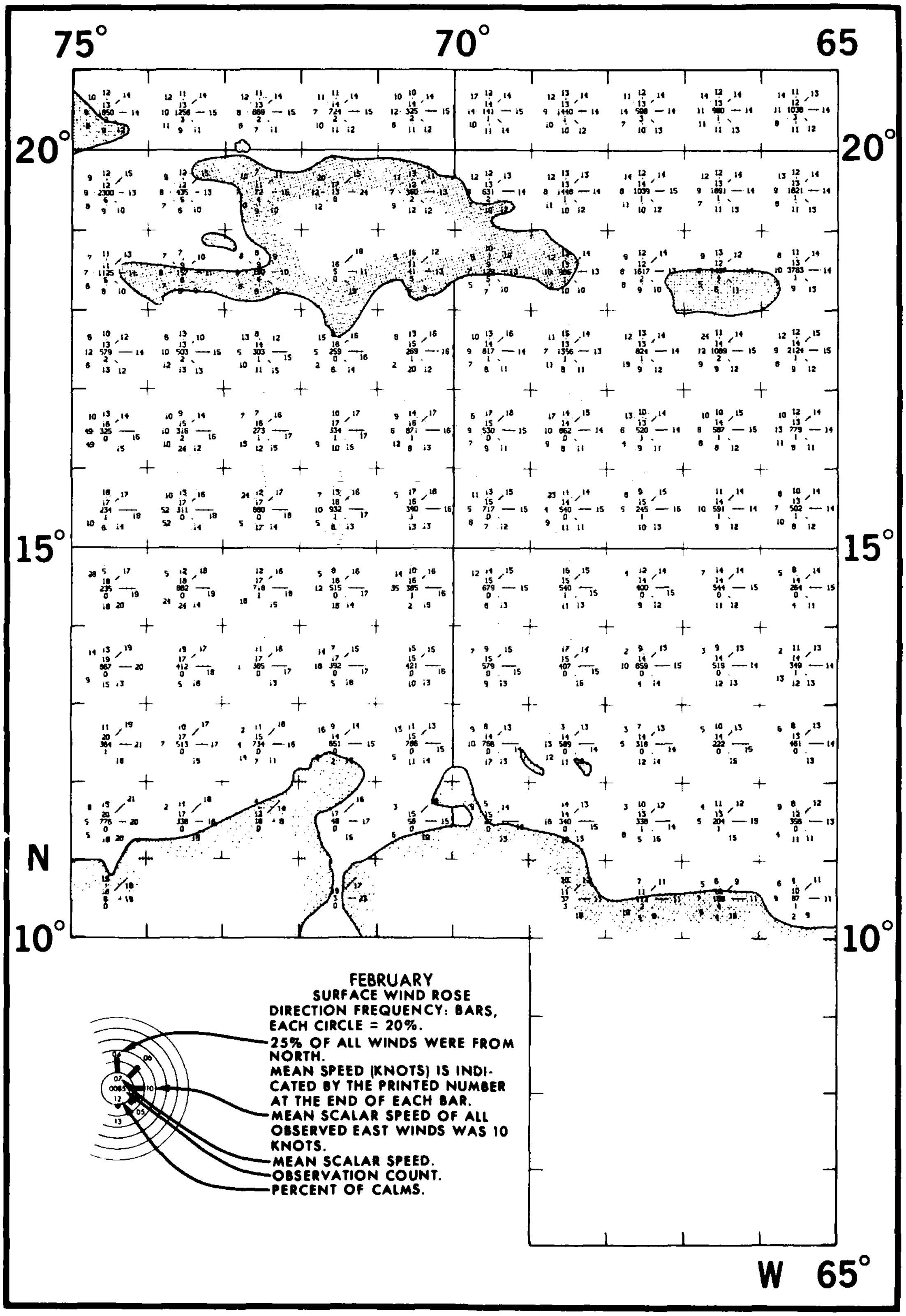


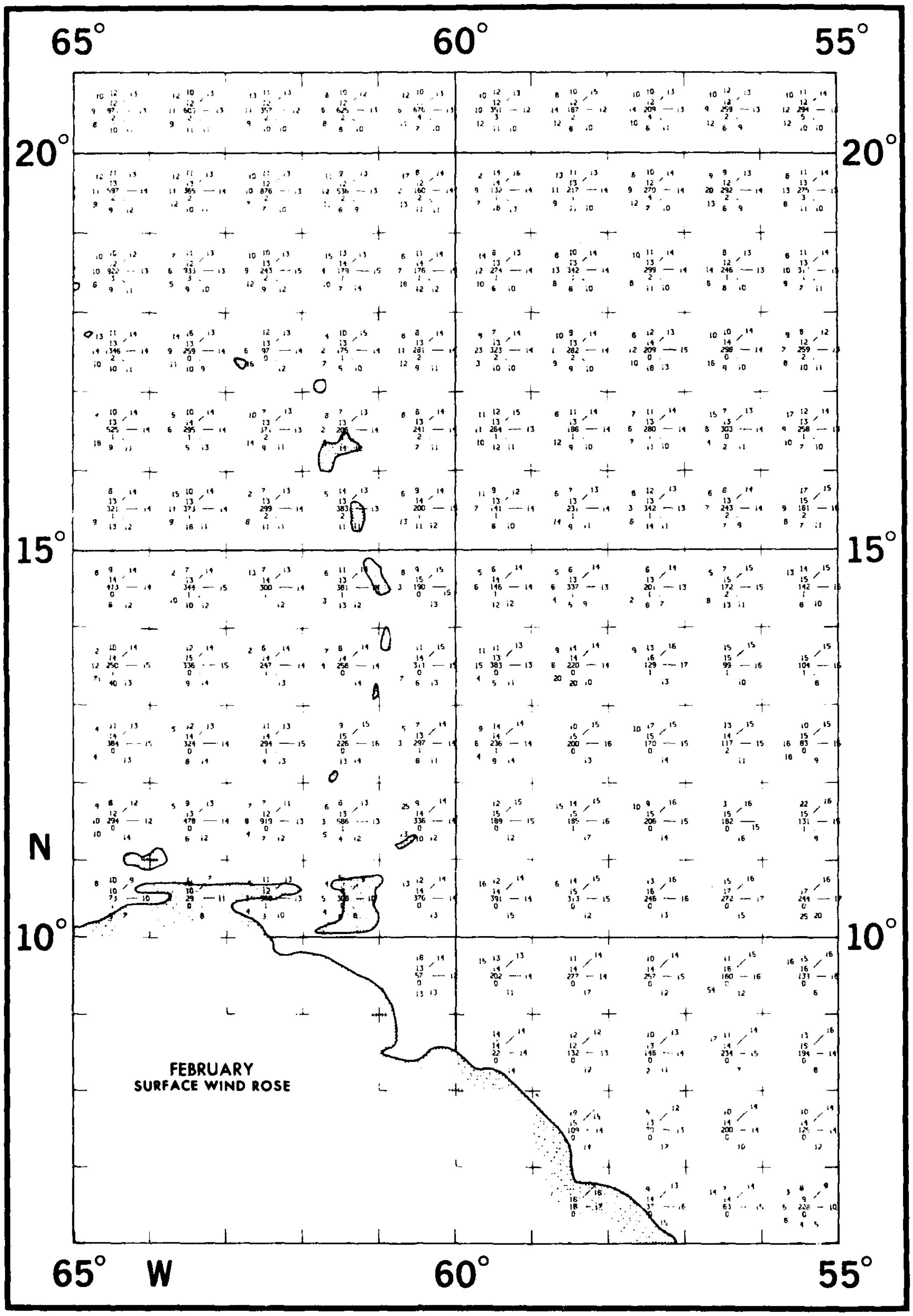
FEBRUARY
WIND SPEED
MEAN SCALAR WIND SPEED (Knots)

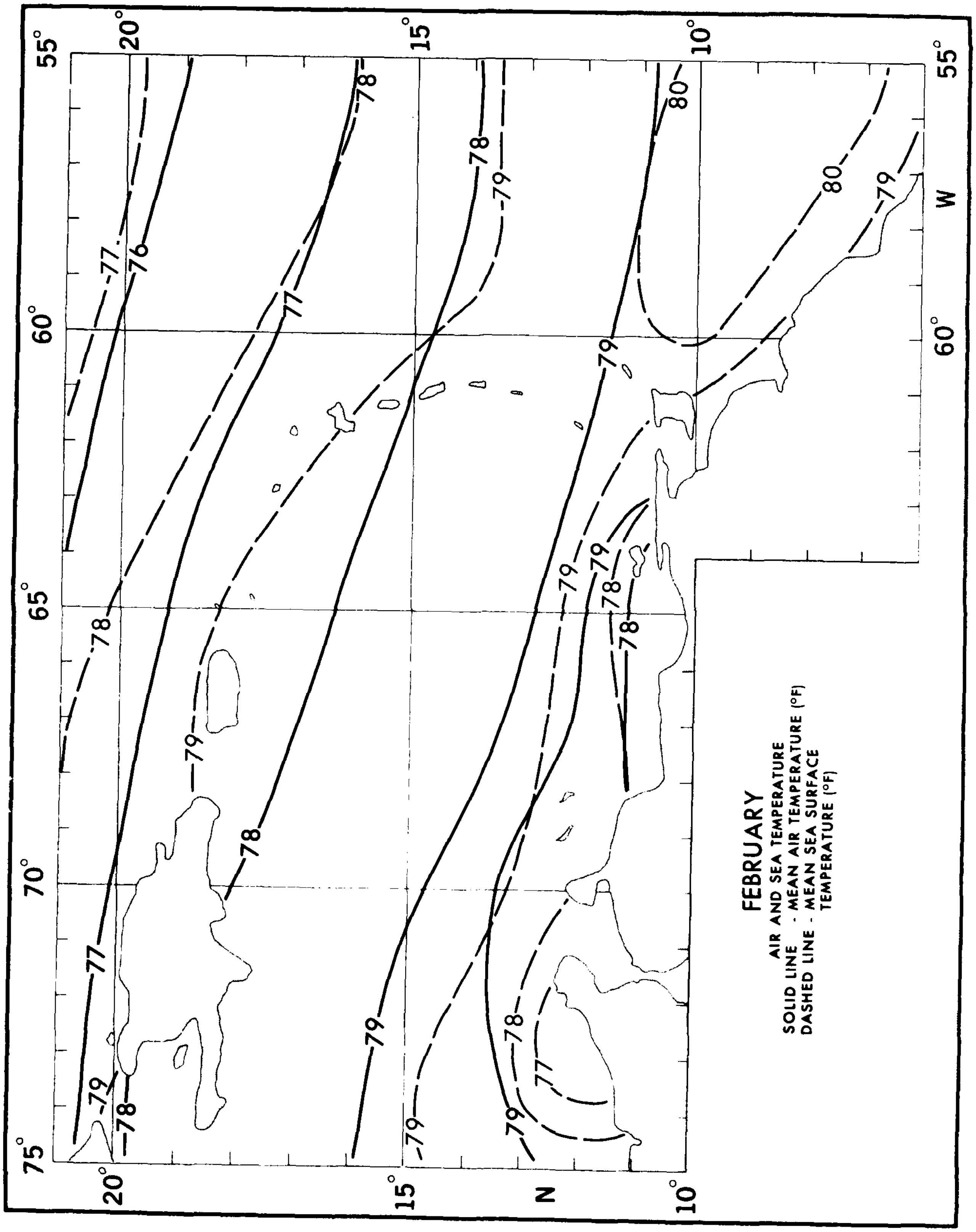


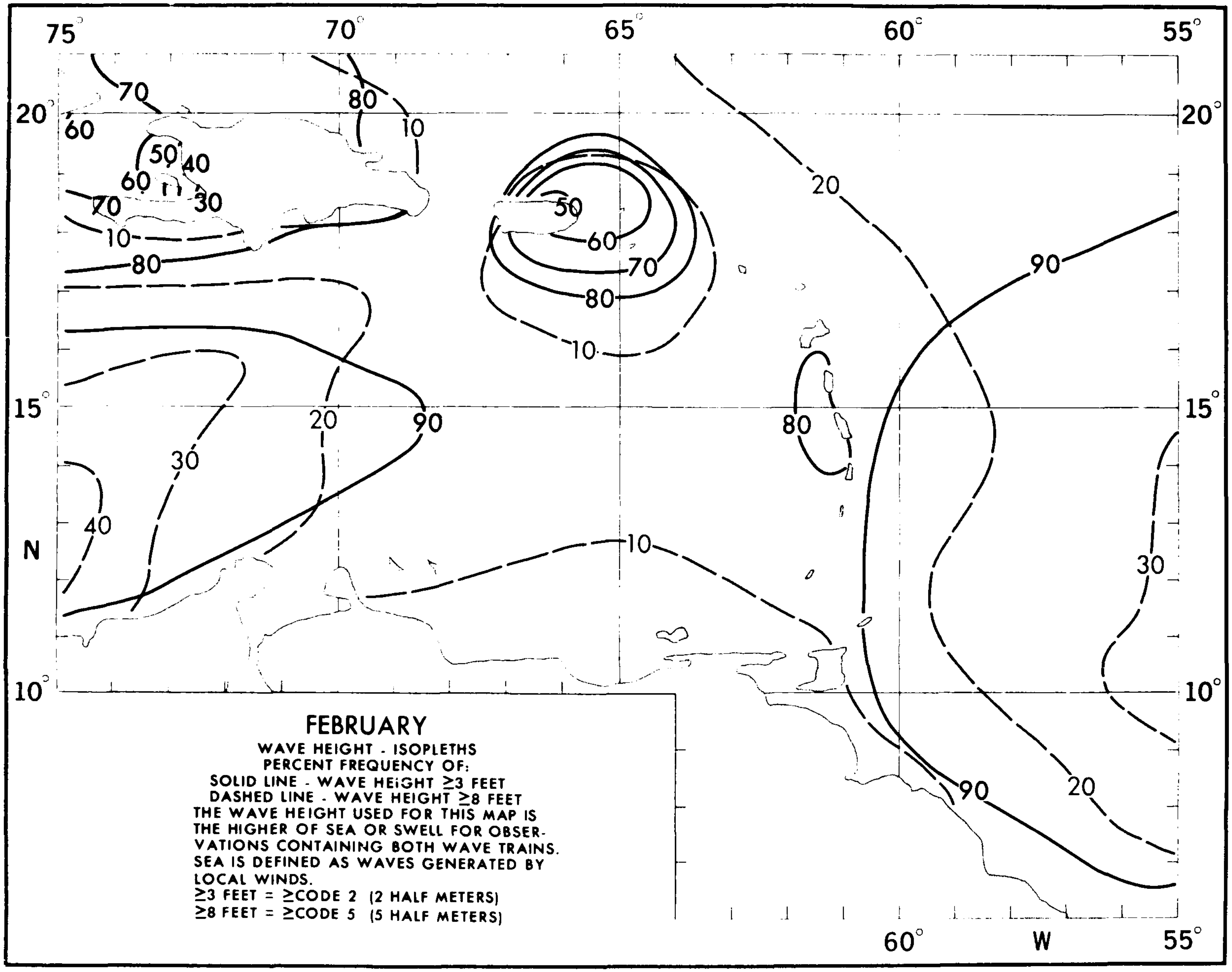
FEBRUARY
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE - WIND SPEED <11 KNOTS
DASHED LINE - WIND SPEED ≥34 KNOTS

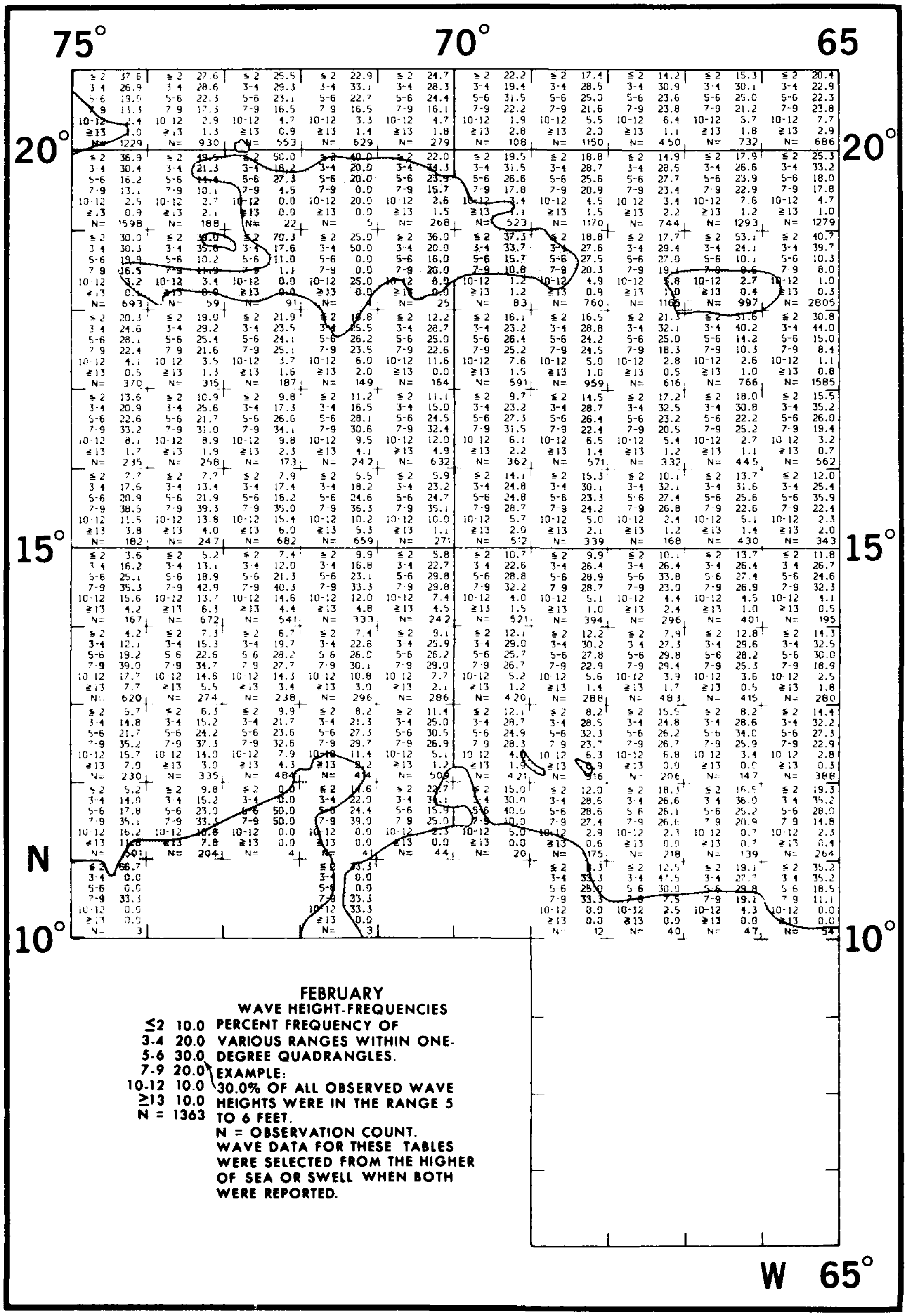

FEBRUARY
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE - WIND SPEED 11-21 KNOTS
DASHED LINE - WIND SPEED 22-33 KNOTS
75°
70°
65°
60°
55°
20°
15°
10°
N
W


75°
70°
65
20°
15°
10°
N
W 65°
FEBRUARY
SURFACE WIND ROSE
DIRECTION FREQUENCY: BARS, EACH CIRCLE = 20%.
25% OF ALL WINDS WERE FROM NORTH.
MEAN SPEED (KNOTS) IS INDICATED BY THE PRINTED NUMBER AT THE END OF EACH BAR.
MEAN SCALAR SPEED OF ALL OBSERVED EAST WINDS WAS 10 KNOTS.
MEAN SCALAR SPEED.
OBSERVATION COUNT.
PERCENT OF CALMS.


65°
60°
55°
20°
15°
N
10°
W
FEBRUARY
SURFACE WIND ROSE


FEBRUARY
AIR AND SEA TEMPERATURE
SOLID LINE - MEAN AIR TEMPERATURE (°F)
DASHED LINE - MEAN SEA SURFACE TEMPERATURE (°F)
75°
70°
65°
60°
55°
20°
15°
10°
N
W
76
77
78
79
80


FEBRUARY
WAVE HEIGHT - ISOPLETHS
PERCENT FREQUENCY OF:
SOLID LINE - WAVE HEIGHT ≥3 FEET
DASHED LINE - WAVE HEIGHT ≥8 FEET
THE WAVE HEIGHT USED FOR THIS MAP IS
THE HIGHER OF SEA OR SWELL FOR OBSER-
VATIONS CONTAINING BOTH WAVE TRAINS.
SEA IS DEFINED AS WAVES GENERATED BY
LOCAL WINDS.
≥3 FEET = ≥CODE 2 (2 HALF METERS)
≥8 FEET = ≥CODE 5 (5 HALF METERS)
75°
70°
65°
60°
55°
20°
15°
10°
N
W



FEBRUARY
WAVE HEIGHT-FREQUENCIES

≤2	10.0	PERCENT FREQUENCY OF
3-4	20.0	VARIOUS RANGES WITHIN ONE-
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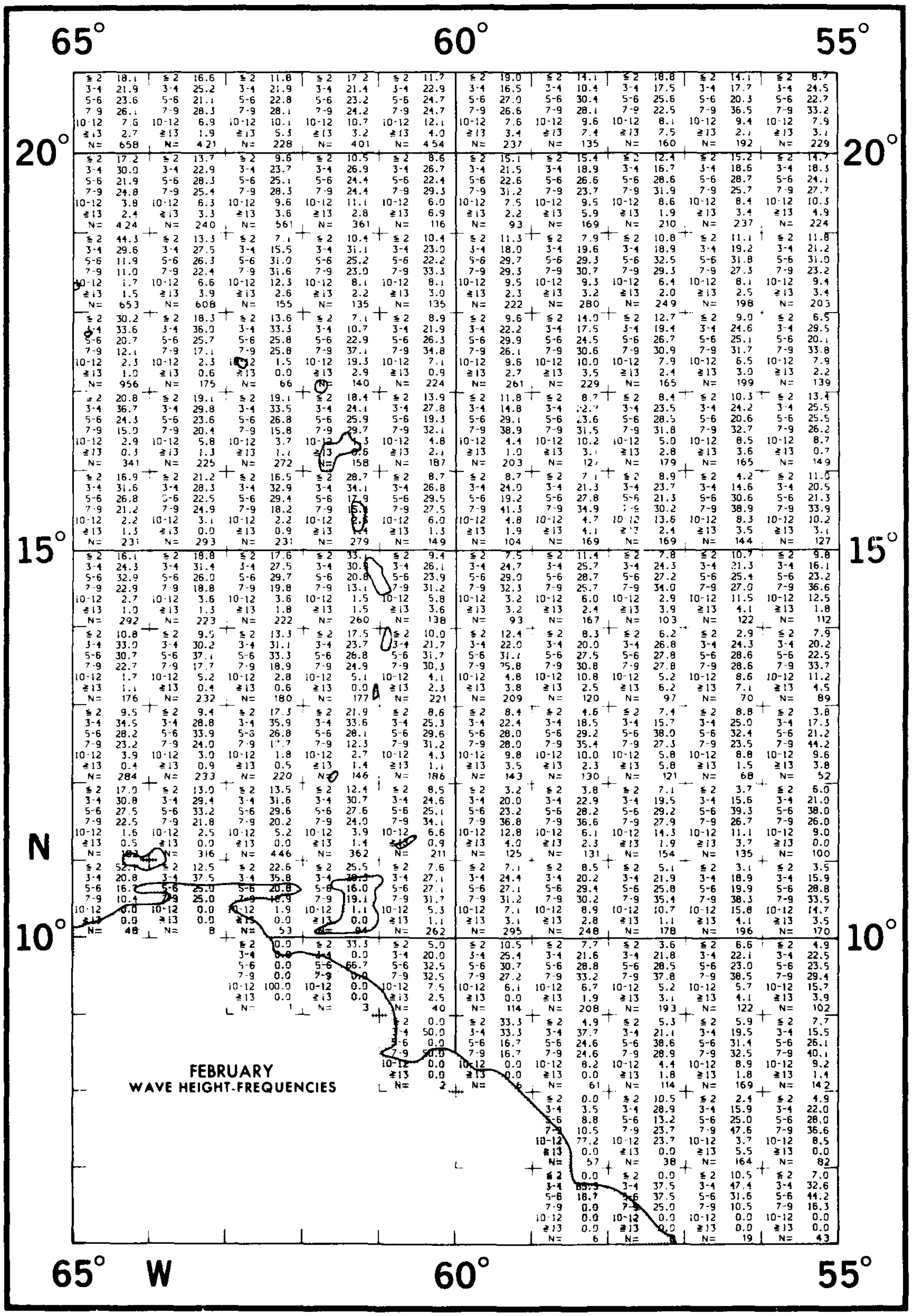
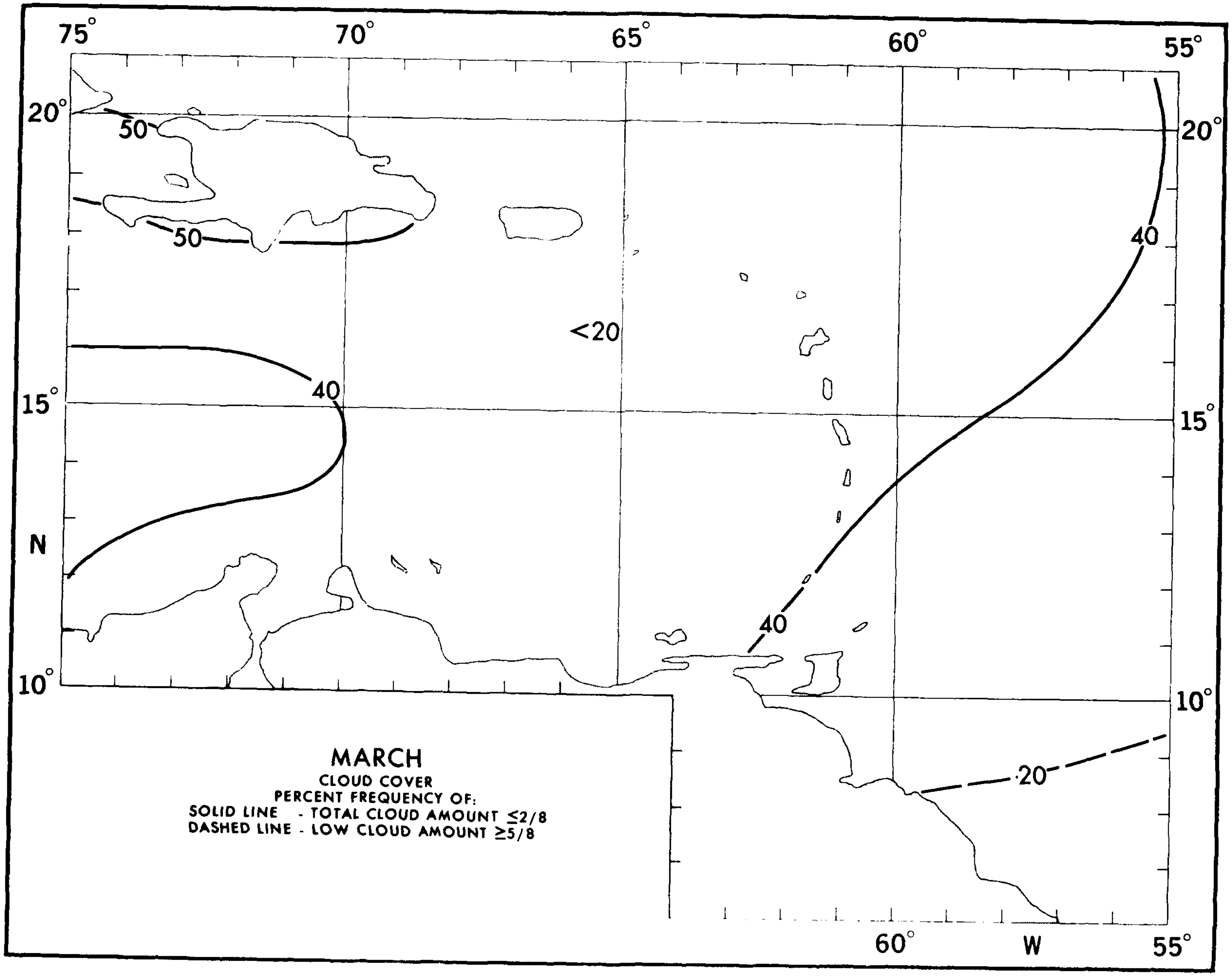
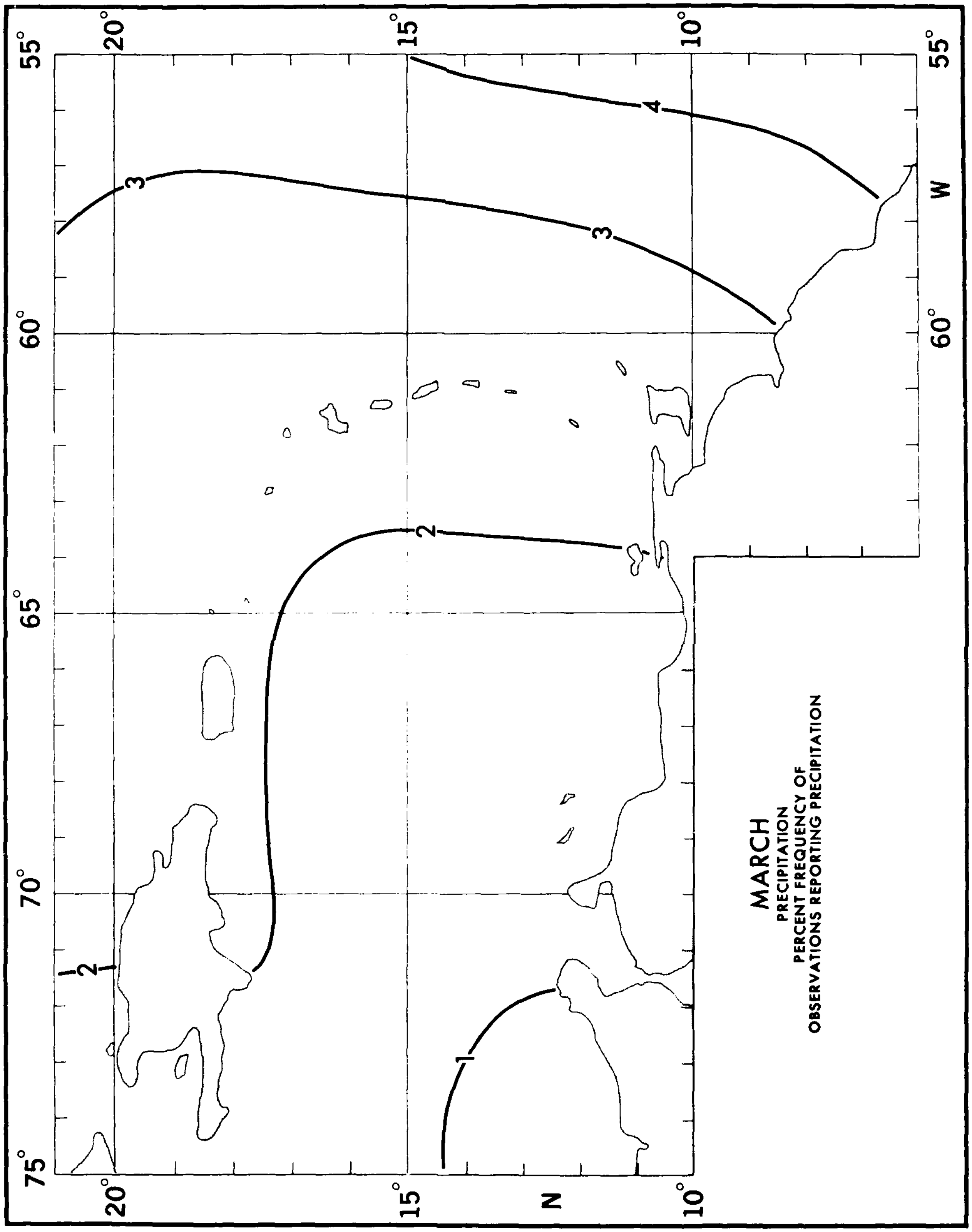
7-9	20.0	EXAMPLE:
10-12	10.0	30.0% OF ALL OBSERVED WAVE
≥13	10.0	HEIGHTS WERE IN THE RANGE 5
N =	1363	TO 6 FEET.

N = OBSERVATION COUNT.
WAVE DATA FOR THESE TABLES WERE SELECTED FROM THE HIGHER OF SEA OR SWELL WHEN BOTH WERE REPORTED.

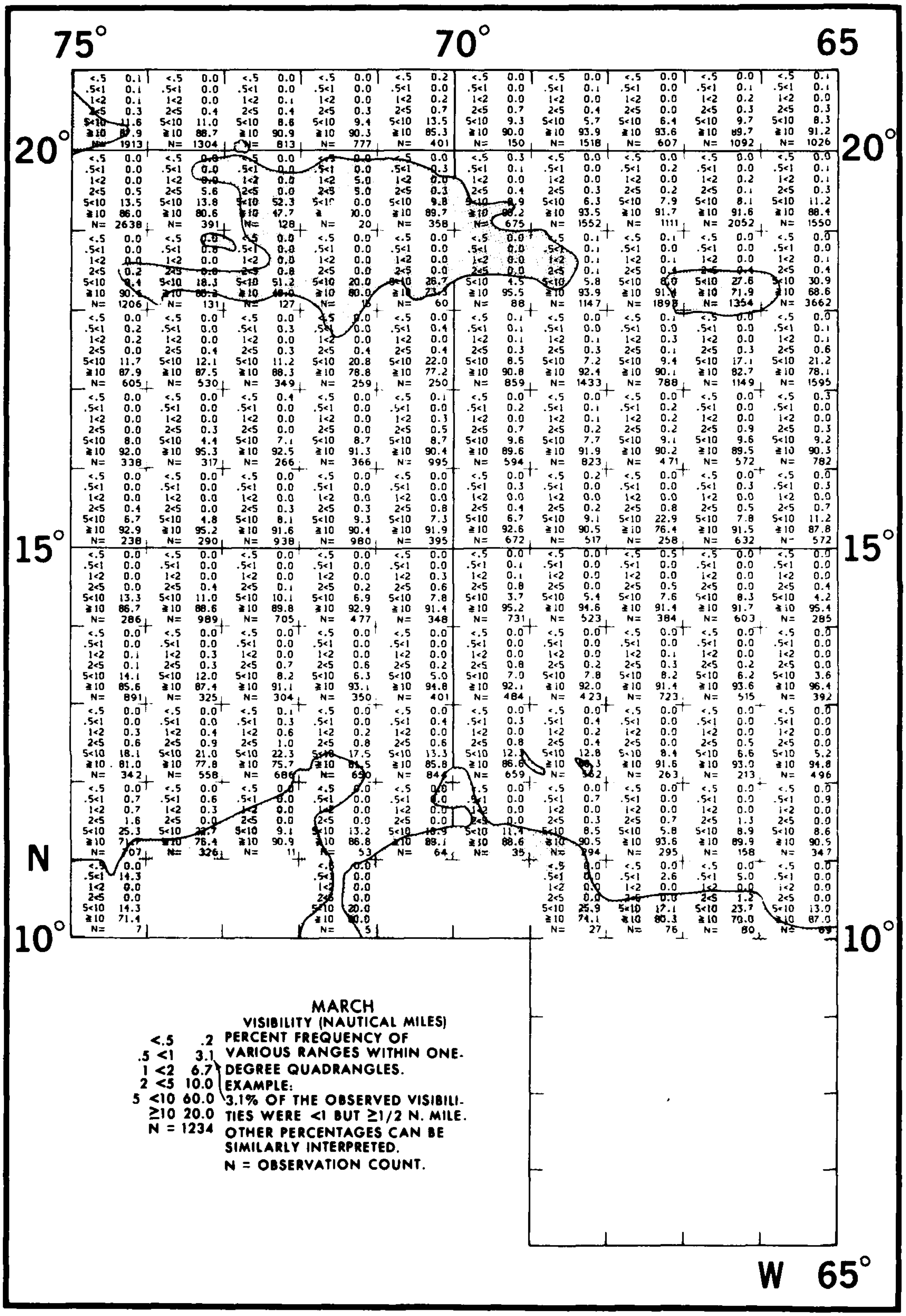

65°
60°
55°
20°
15°
10°
N
W
FEBRUARY
WAVE HEIGHT-FREQUENCIES



MARCH
CLOUD COVER
PERCENT FREQUENCY OF:
SOLID LINE - TOTAL CLOUD AMOUNT $\leq 2/8$
DASHED LINE - LOW CLOUD AMOUNT $\geq 5/8$



MARCH
PRECIPITATION
PERCENT FREQUENCY OF
OBSERVATIONS REPORTING PRECIPITATION



MARCH

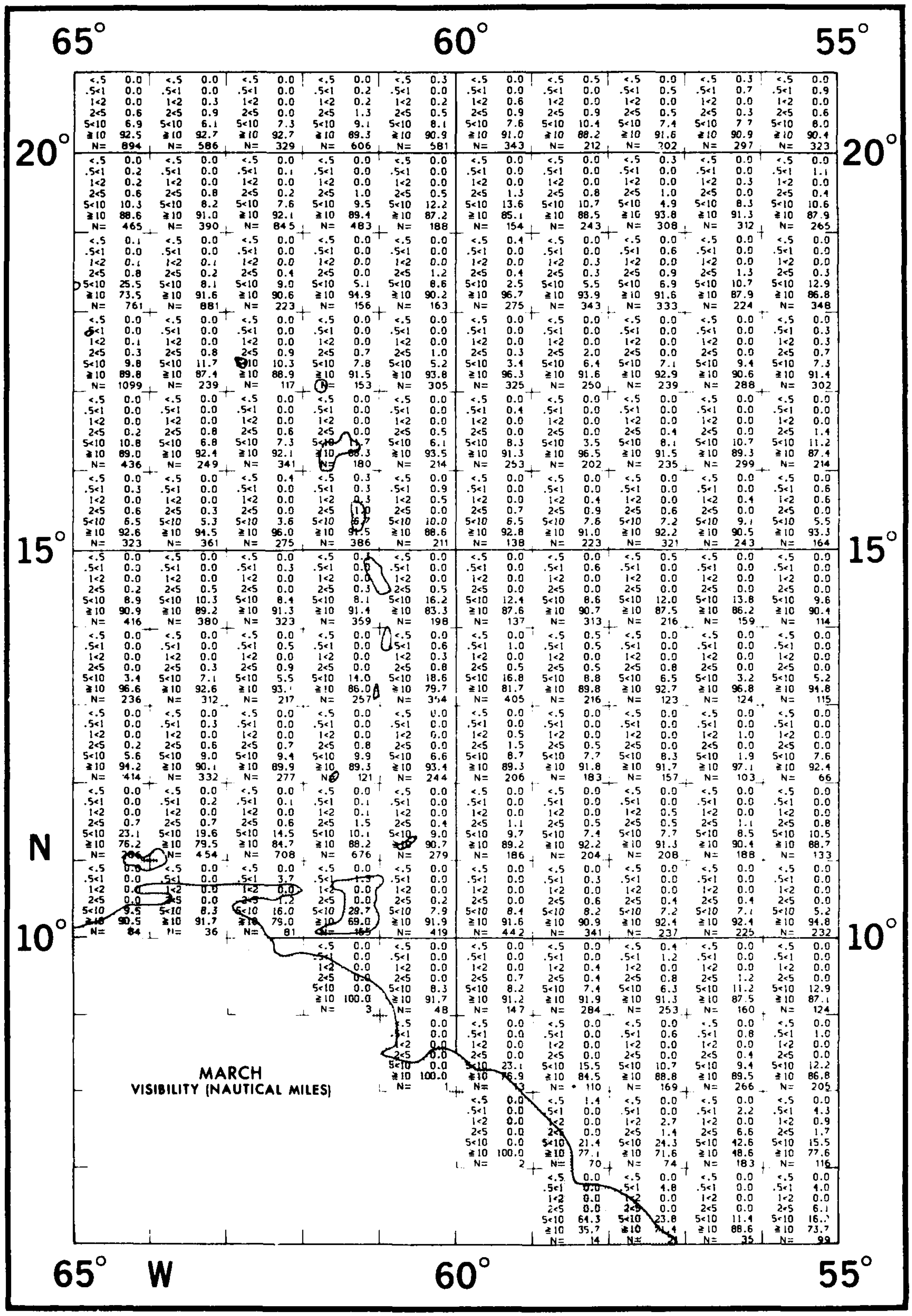
VISIBILITY (NAUTICAL MILES)

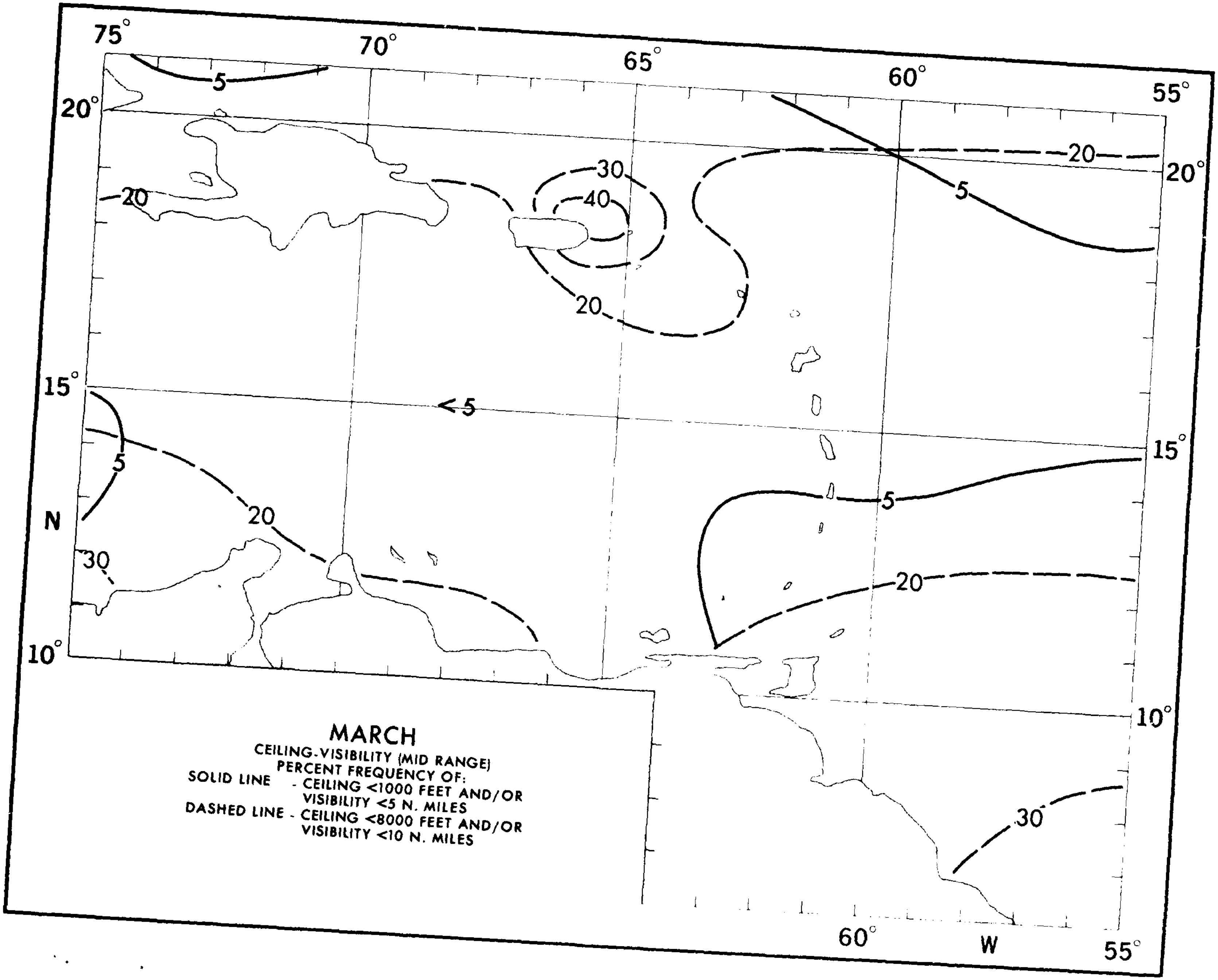
<.5	.2
.5 <1	3.1
1 <2	6.7
2 <5	10.0
5 <10	60.0
≥10	20.0
N = 1234	

PERCENT FREQUENCY OF VARIOUS RANGES WITHIN ONE-DEGREE QUADRANGLES.

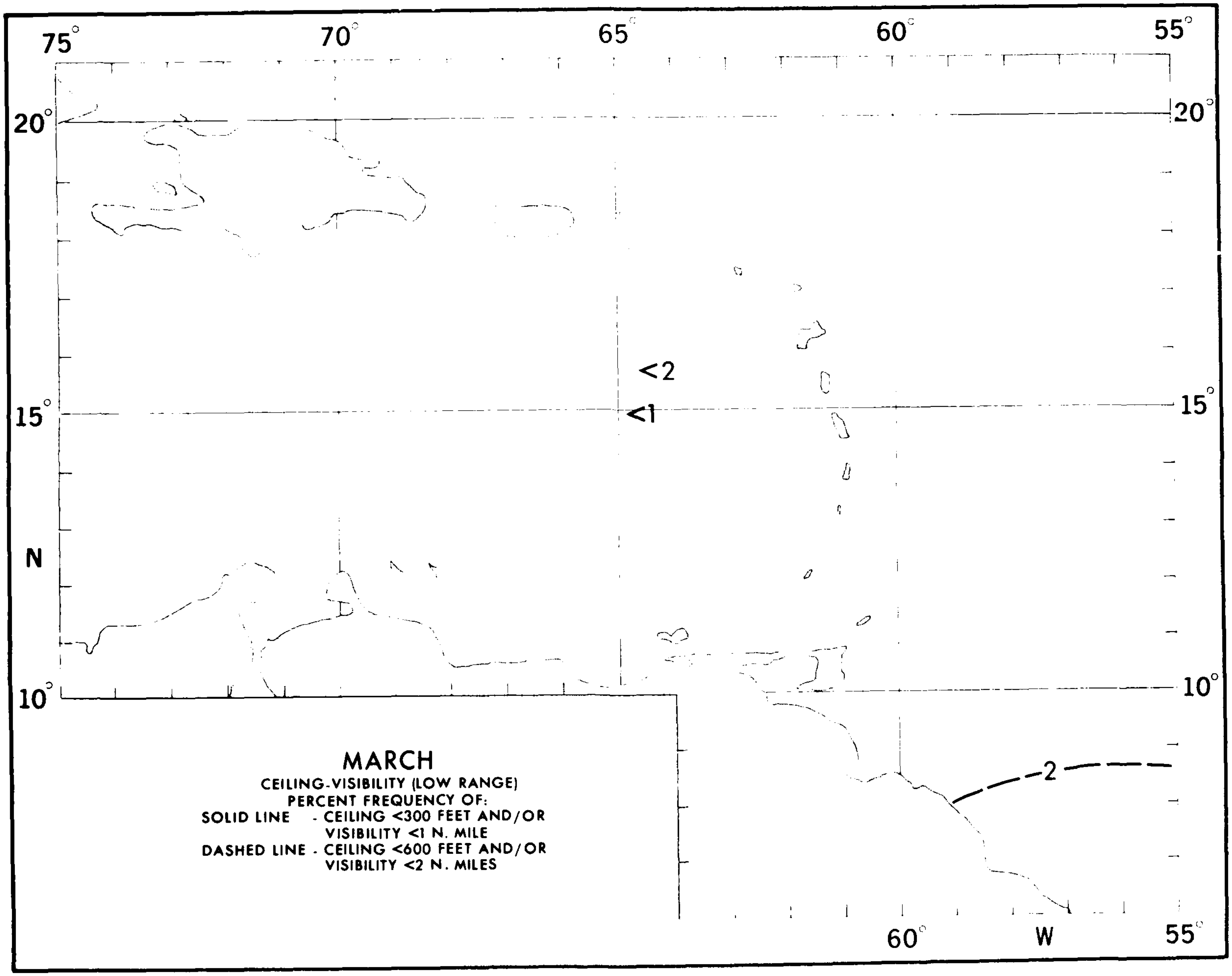
EXAMPLE:
3.1% OF THE OBSERVED VISIBILITIES WERE <1 BUT ≥1/2 N. MILE. OTHER PERCENTAGES CAN BE SIMILARLY INTERPRETED.

N = OBSERVATION COUNT.

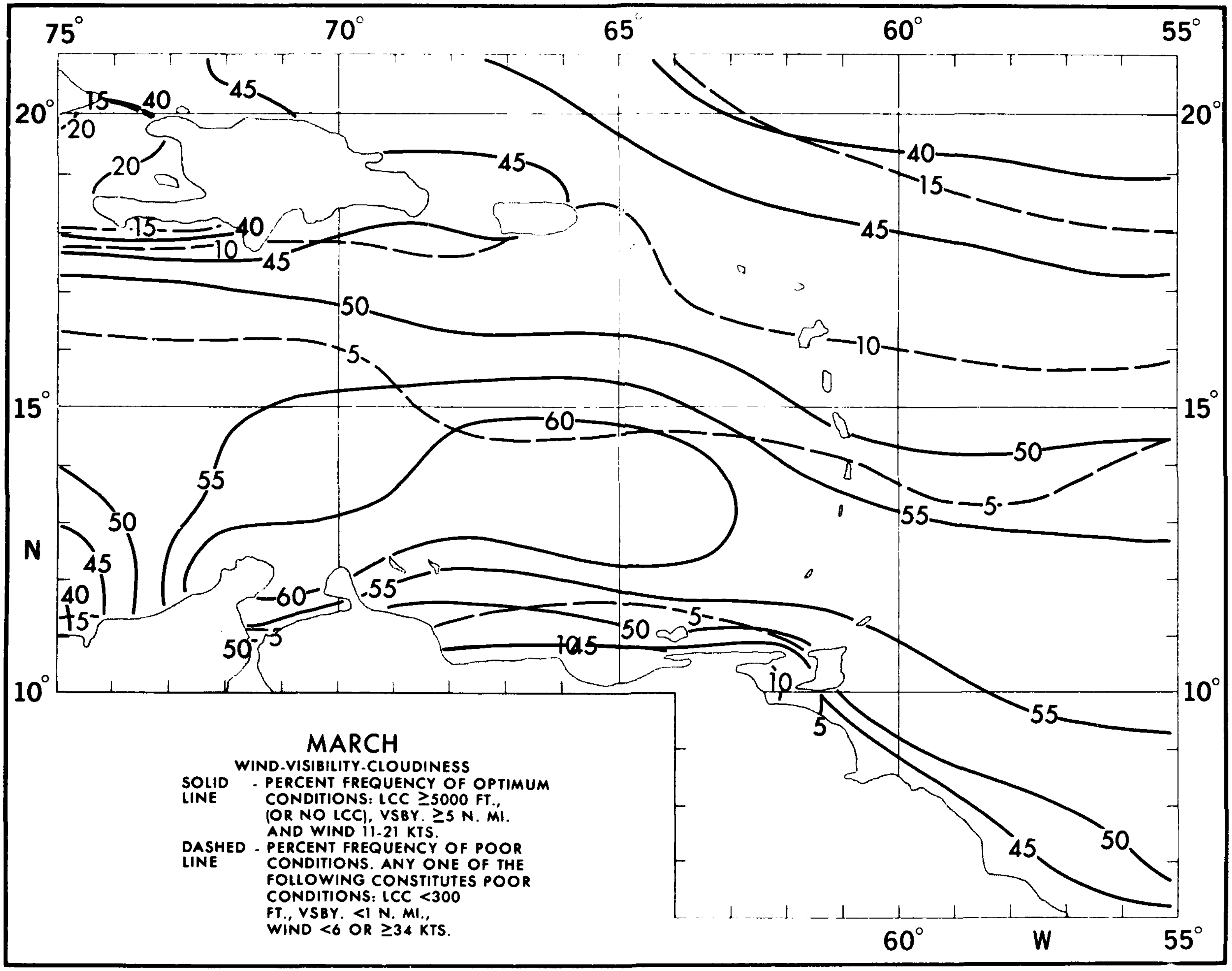

65°
60°
55°
20°
15°
10°
N
65° W
MARCH
VISIBILITY (NAUTICAL MILES)

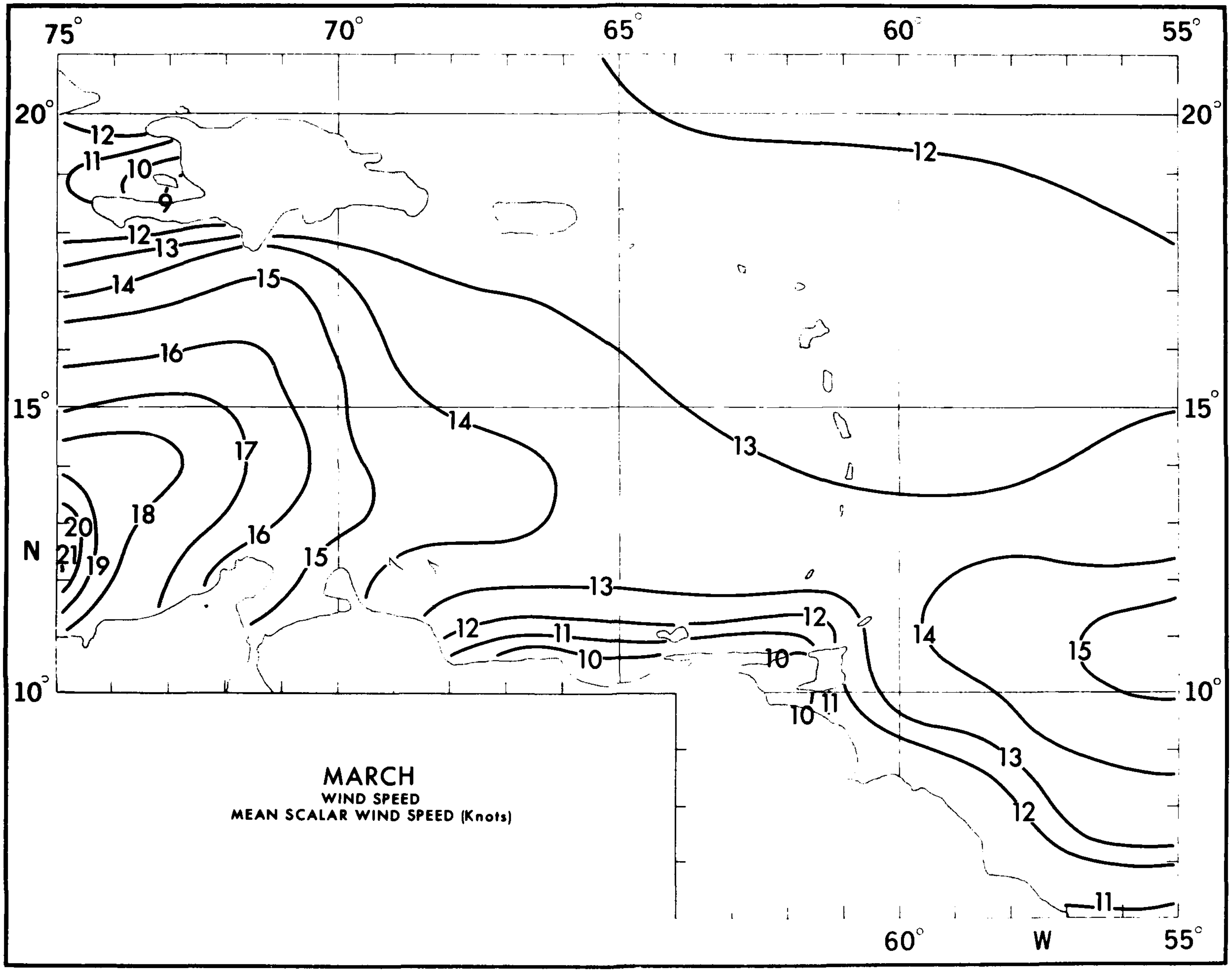


MARCH
CEILING-VISIBILITY (MID RANGE)
PERCENT FREQUENCY OF:
SOLID LINE - CEILING <1000 FEET AND/OR VISIBILITY <5 N. MILES
DASHED LINE - CEILING <8000 FEET AND/OR VISIBILITY <10 N. MILES

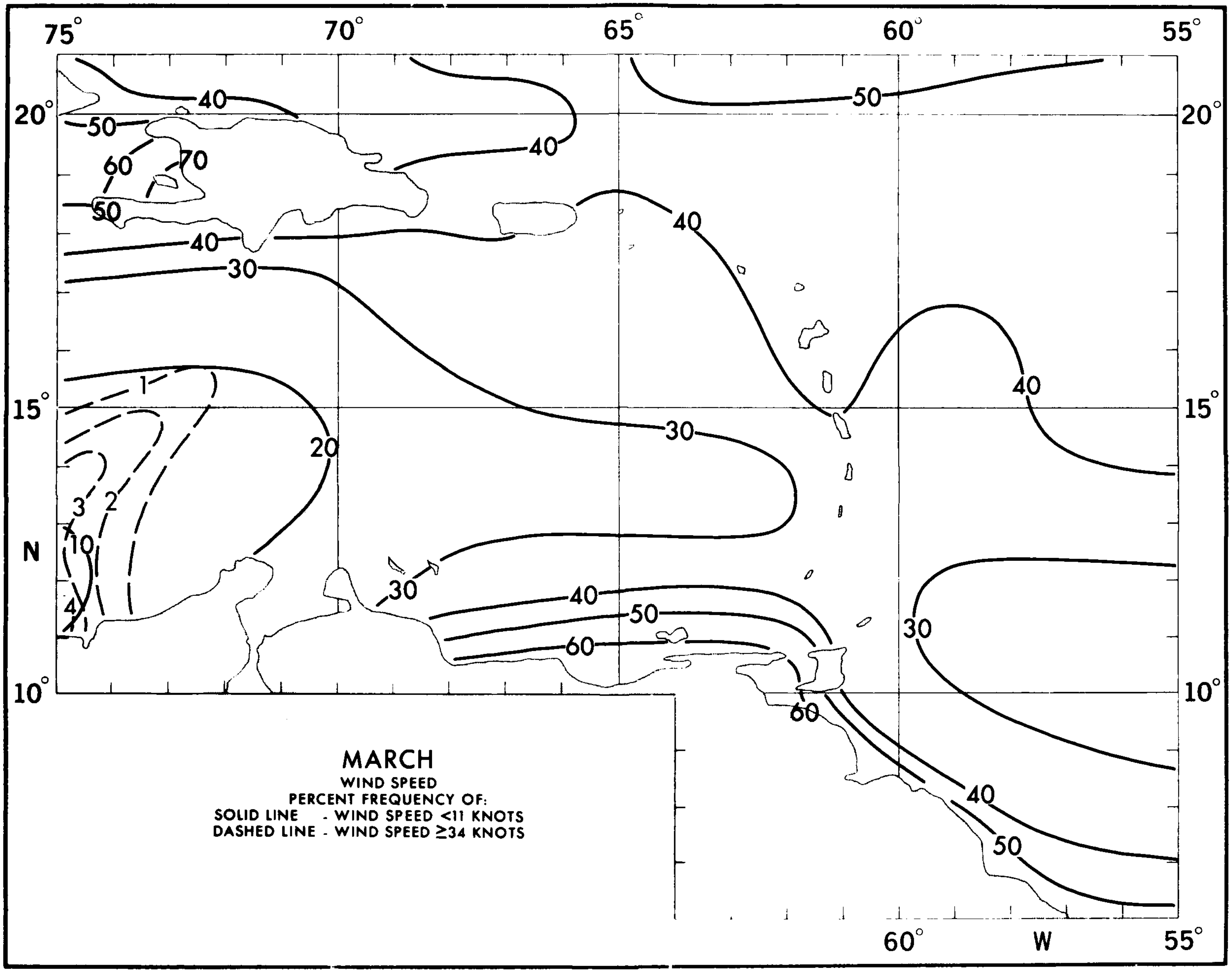


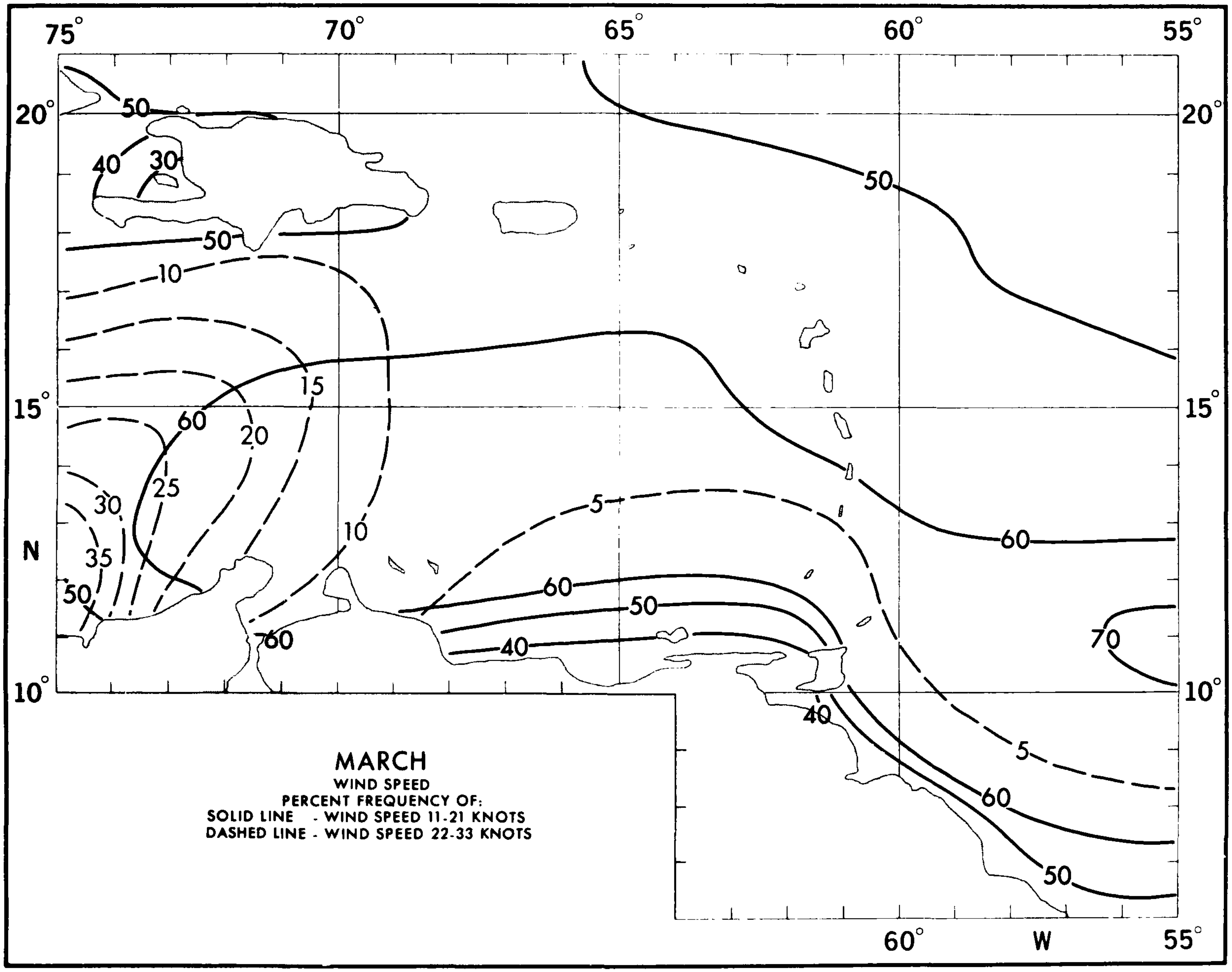
75°
70°
65°
60°
55°
20°
15°
10°
N
W
<2
<1
2
MARCH
CEILING-VISIBILITY (LOW RANGE)
PERCENT FREQUENCY OF:
SOLID LINE - CEILING <300 FEET AND/OR VISIBILITY <1 N. MILE
DASHED LINE - CEILING <600 FEET AND/OR VISIBILITY <2 N. MILES


75°
70°
65°
60°
55°
20°
15°
10°
N
W
MARCH
WIND-VISIBILITY-CLOUDINESS
SOLID LINE - PERCENT FREQUENCY OF OPTIMUM CONDITIONS: LCC ≥5000 FT., (OR NO LCC), VSBY. ≥5 N. MI. AND WIND 11-21 KTS.
DASHED LINE - PERCENT FREQUENCY OF POOR CONDITIONS. ANY ONE OF THE FOLLOWING CONSTITUTES POOR CONDITIONS: LCC <300 FT., VSBY. <1 N. MI., WIND <6 OR ≥34 KTS.

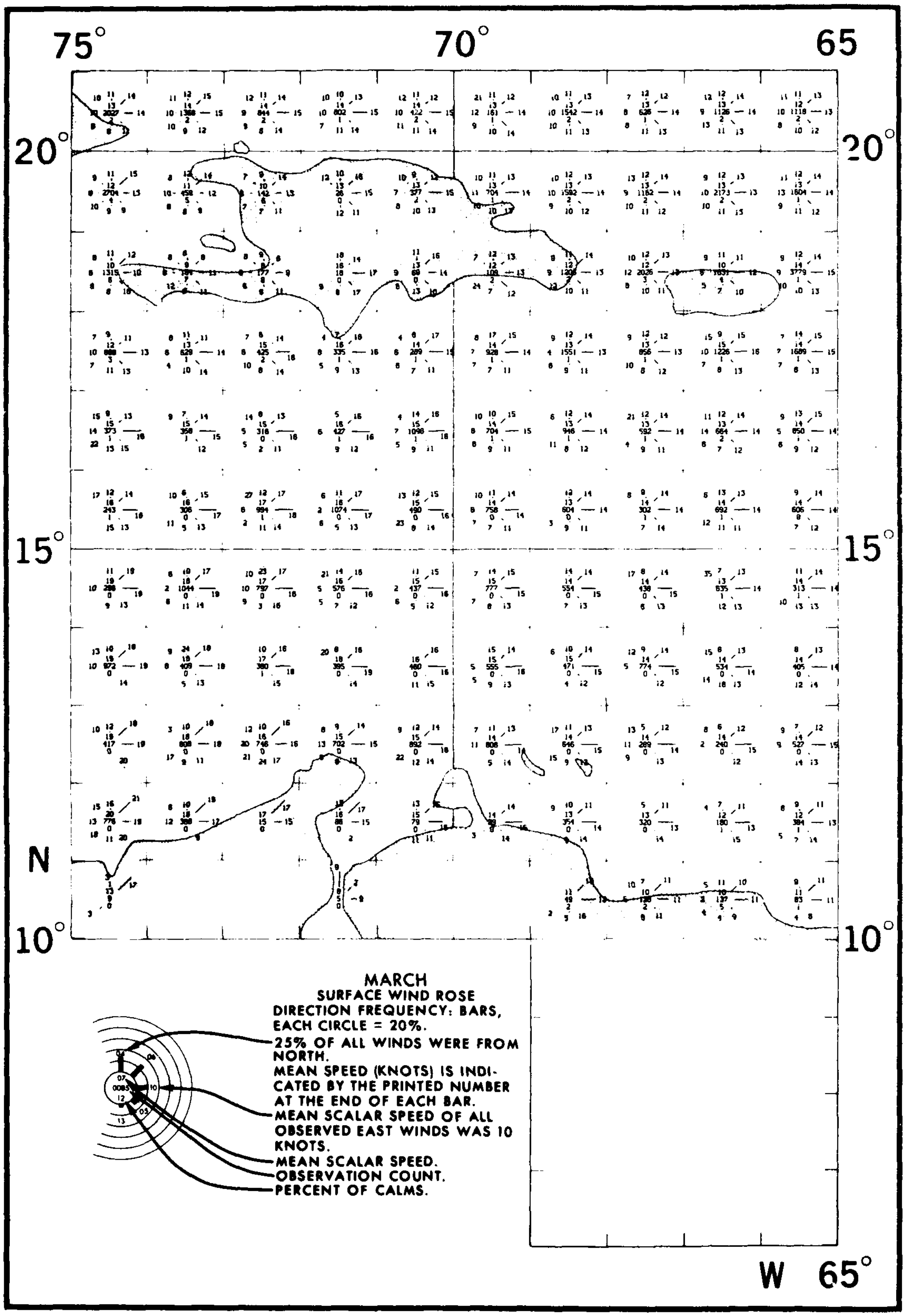


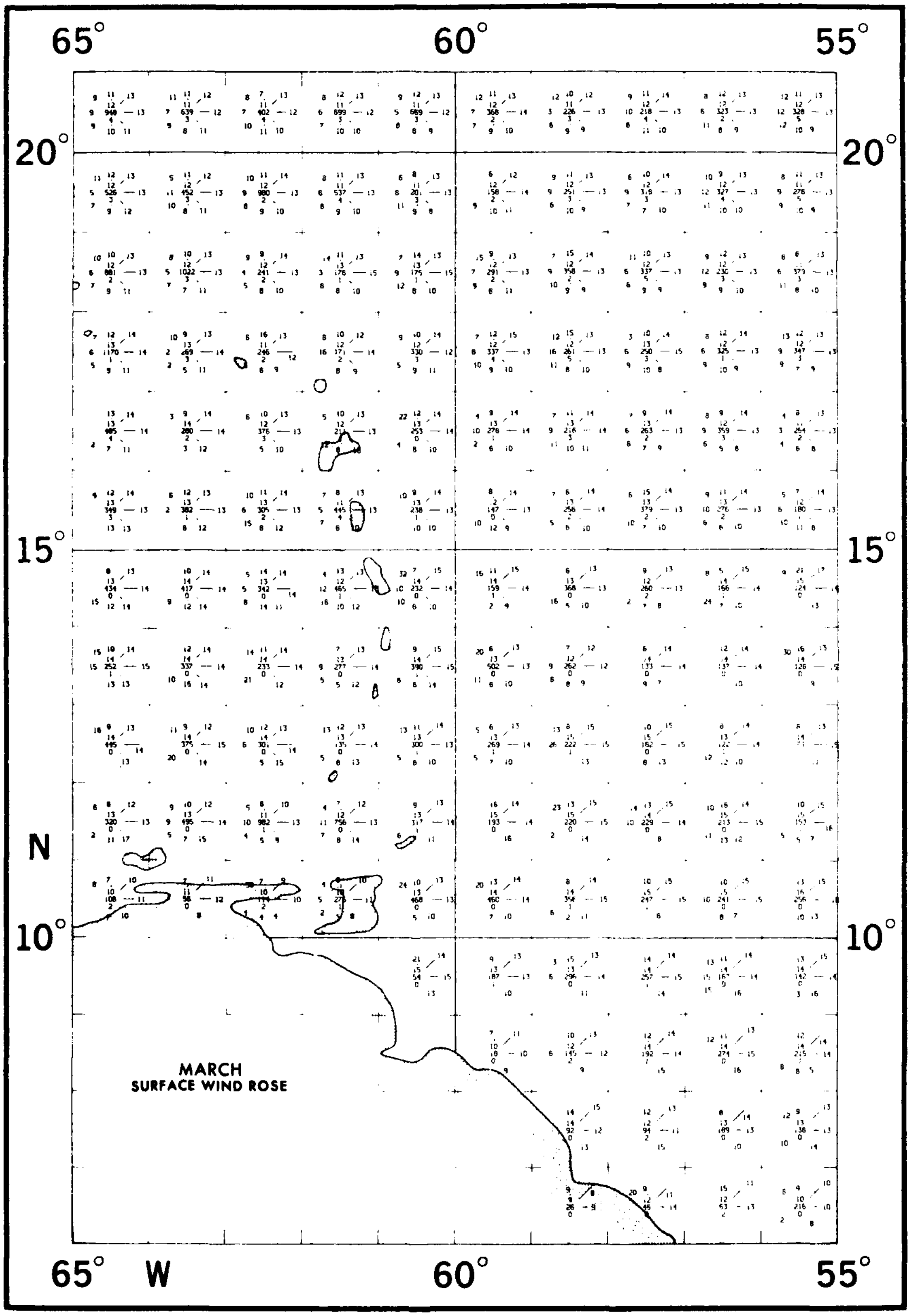
MARCH
WIND SPEED
MEAN SCALAR WIND SPEED (Knots)

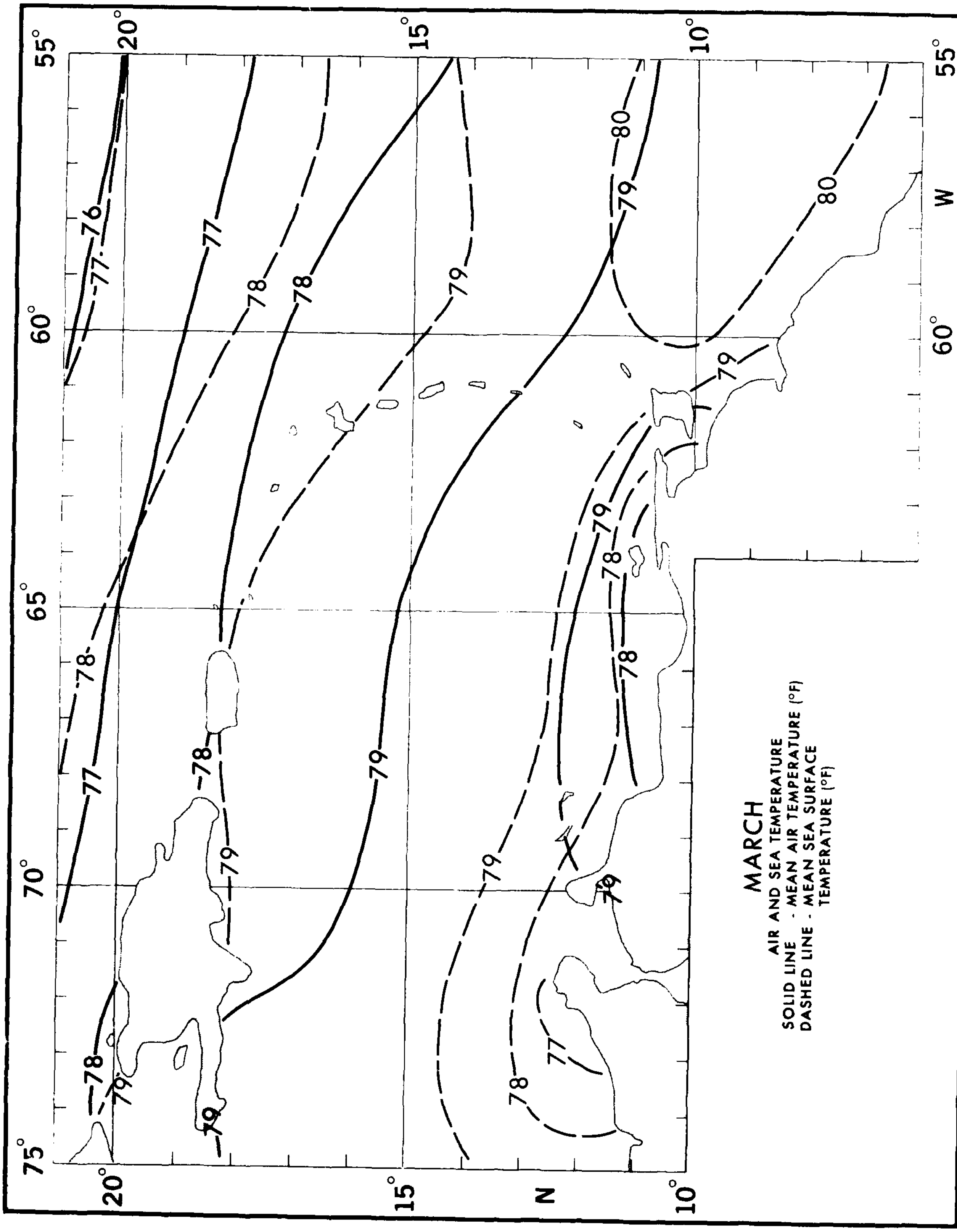

MARCH
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE - WIND SPEED <11 KNOTS
DASHED LINE - WIND SPEED ≥34 KNOTS
75°
70°
65°
60°
55°
20°
15°
10°
N
W

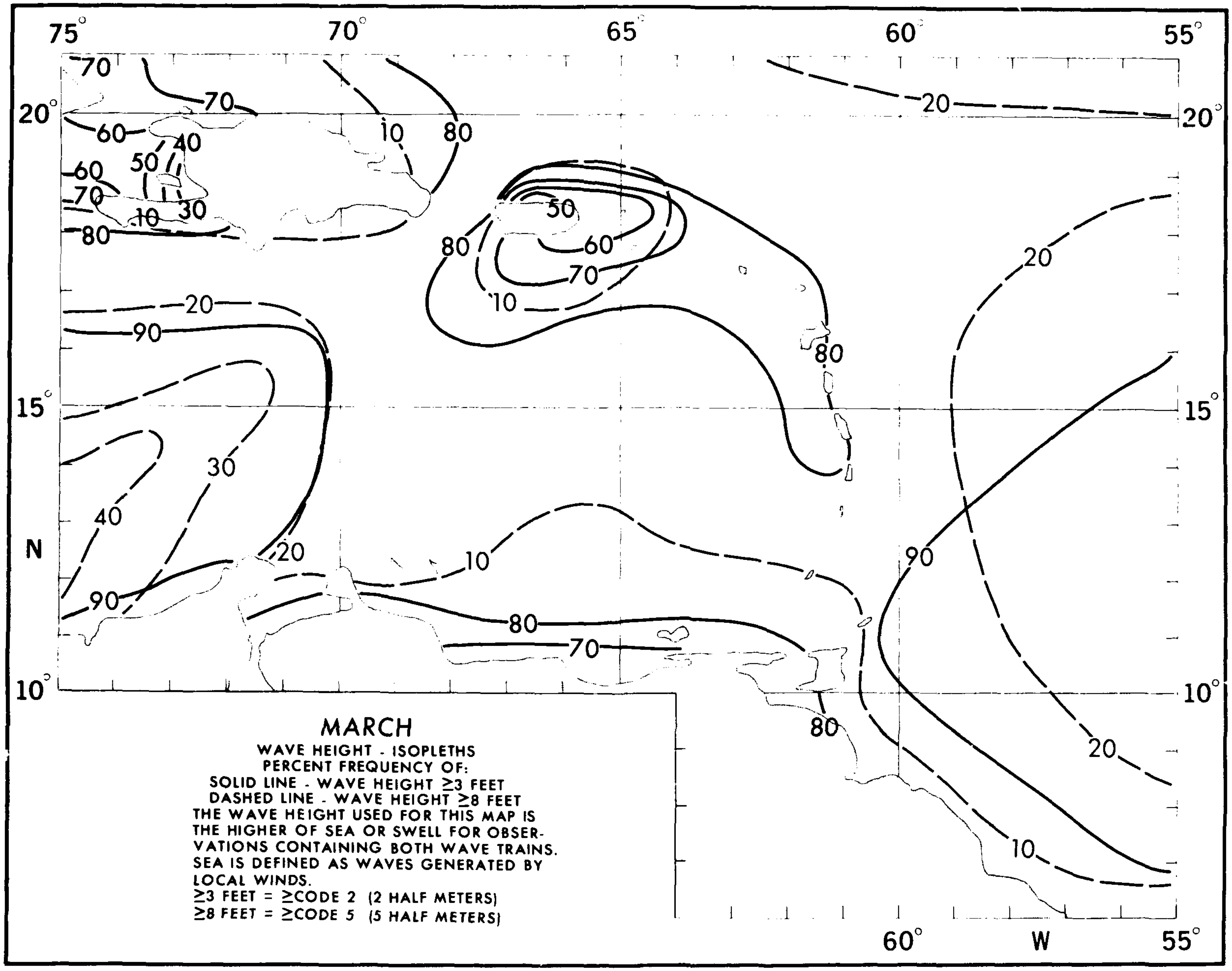


MARCH
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE - WIND SPEED 11-21 KNOTS
DASHED LINE - WIND SPEED 22-33 KNOTS


75°
70°
65
20°
15°
10°
N
W 65°
MARCH
SURFACE WIND ROSE
DIRECTION FREQUENCY: BARS, EACH CIRCLE = 20%.
25% OF ALL WINDS WERE FROM NORTH.
MEAN SPEED (KNOTS) IS INDICATED BY THE PRINTED NUMBER AT THE END OF EACH BAR.
MEAN SCALAR SPEED OF ALL OBSERVED EAST WINDS WAS 10 KNOTS.
MEAN SCALAR SPEED.
OBSERVATION COUNT.
PERCENT OF CALMS.

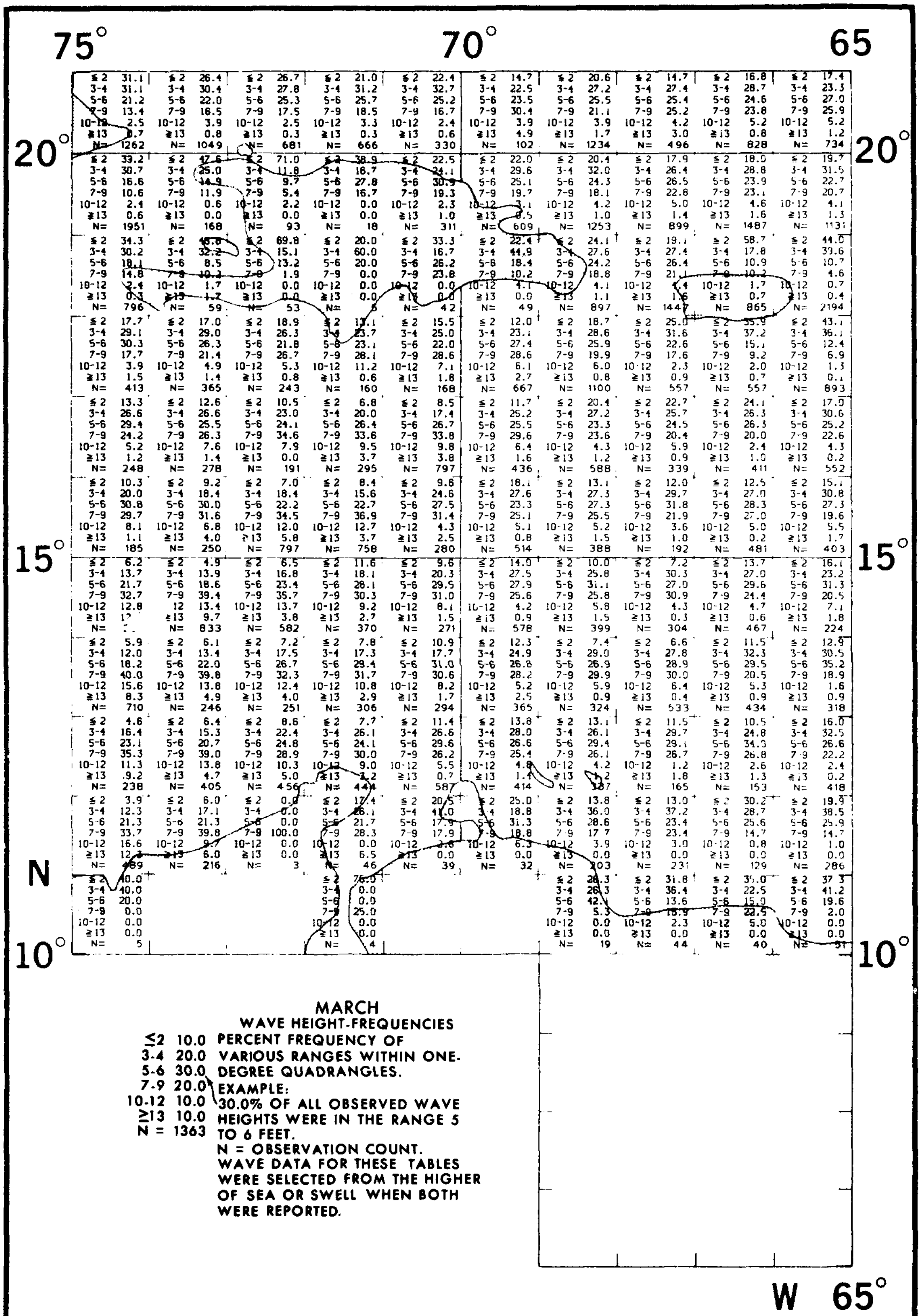

65°
60°
55°
20°
15°
10°
N
W
MARCH
SURFACE WIND ROSE


MARCH
AIR AND SEA TEMPERATURE
SOLID LINE - MEAN AIR TEMPERATURE (°F)
DASHED LINE - MEAN SEA SURFACE
TEMPERATURE (°F)
55°
60°
65°
70°
75°
20°
15°
10°
N
W
76
77
78
79
80



MARCH

WAVE HEIGHT - ISOPLETHS
PERCENT FREQUENCY OF:
SOLID LINE - WAVE HEIGHT ≥3 FEET
DASHED LINE - WAVE HEIGHT ≥8 FEET
THE WAVE HEIGHT USED FOR THIS MAP IS THE HIGHER OF SEA OR SWELL FOR OBSERVATIONS CONTAINING BOTH WAVE TRAINS. SEA IS DEFINED AS WAVES GENERATED BY LOCAL WINDS.
≥3 FEET = ≥CODE 2 (2 HALF METERS)
≥8 FEET = ≥CODE 5 (5 HALF METERS)



MARCH

WAVE HEIGHT-FREQUENCIES

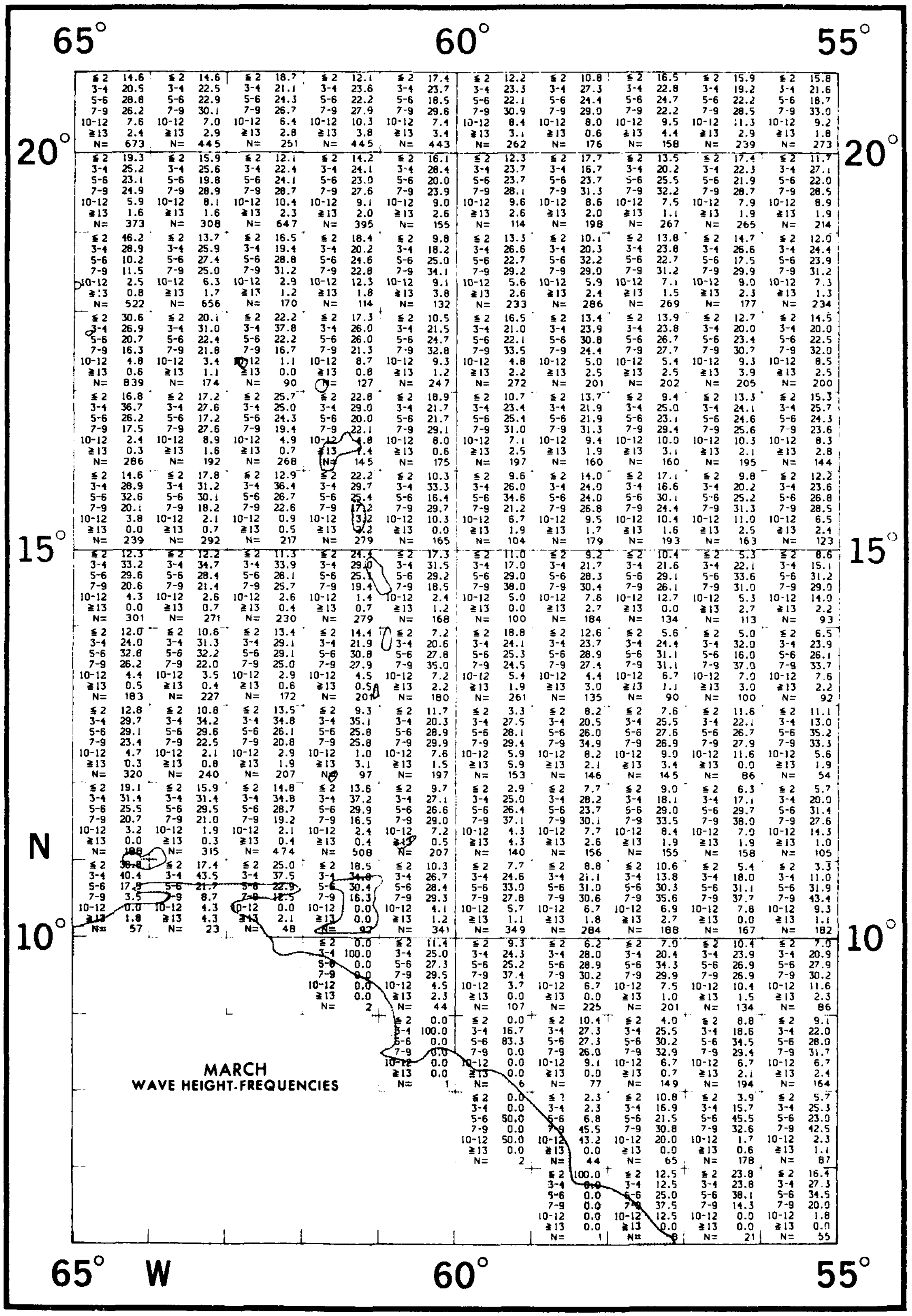
≤2	10.0
3-4	20.0
5-6	30.0
7-9	20.0
10-12	10.0
≥13	10.0
N =	1363

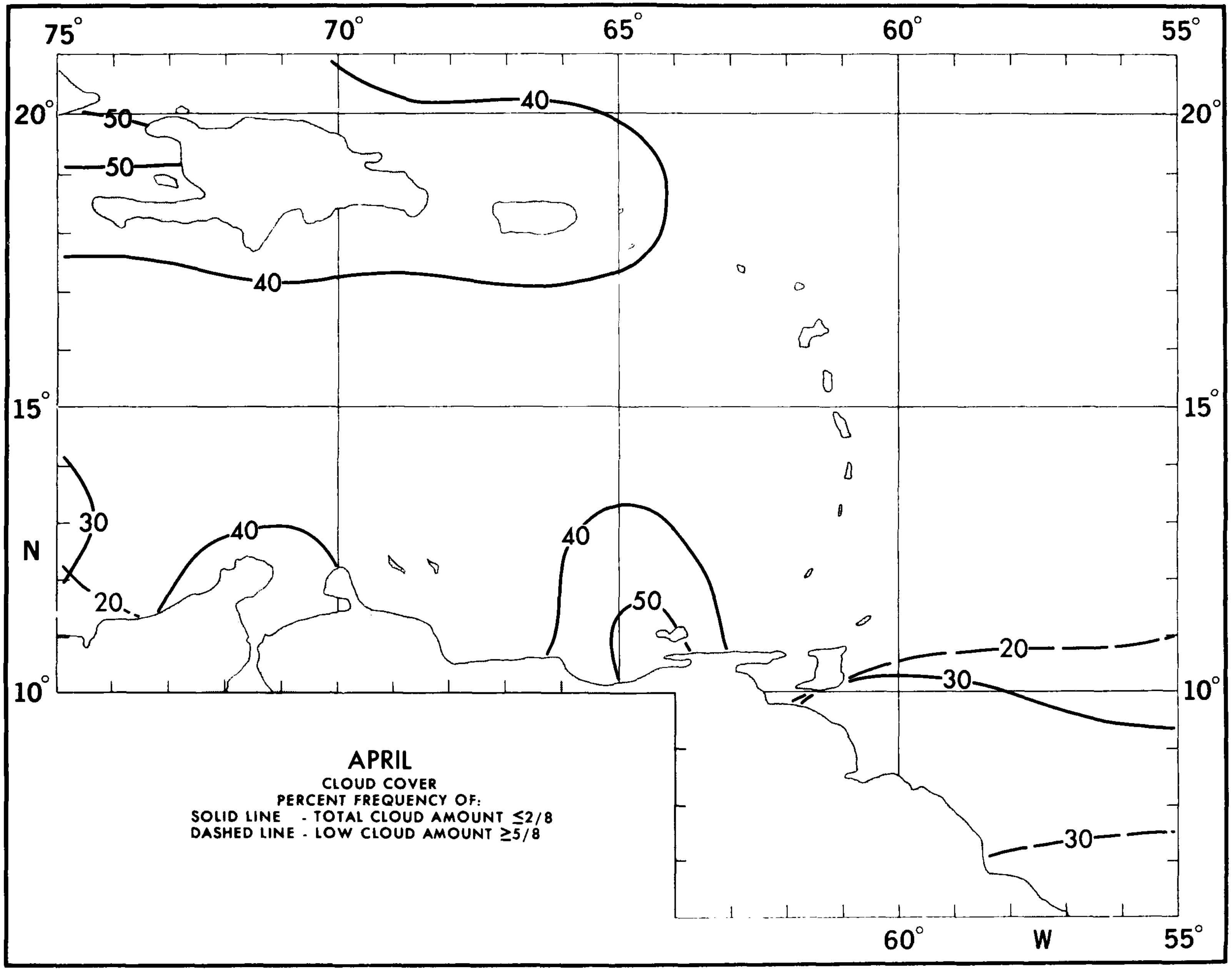
PERCENT FREQUENCY OF VARIOUS RANGES WITHIN ONE-DEGREE QUADRANGLES.

EXAMPLE:
30.0% OF ALL OBSERVED WAVE HEIGHTS WERE IN THE RANGE 5 TO 6 FEET.

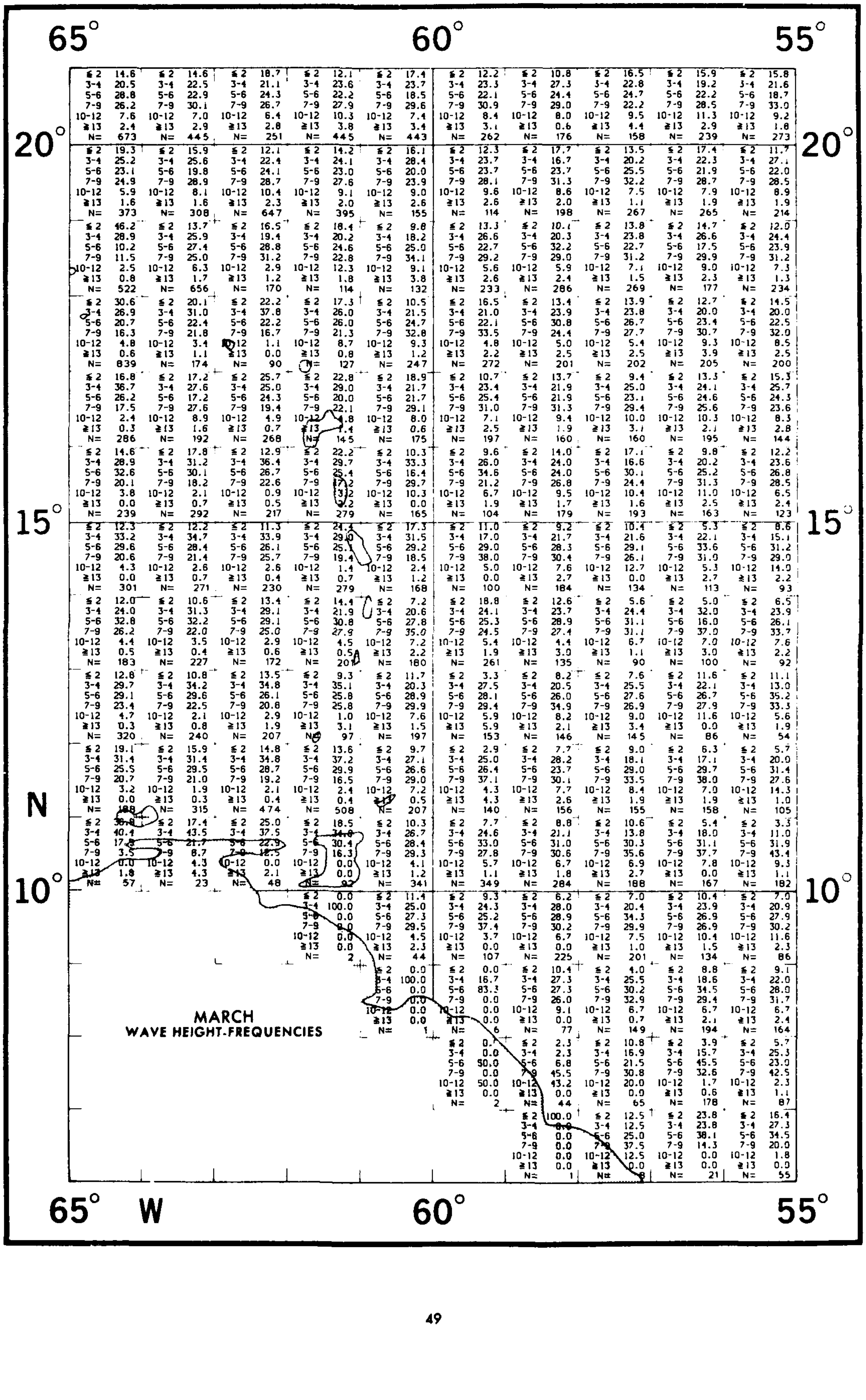
N = OBSERVATION COUNT.

WAVE DATA FOR THESE TABLES WERE SELECTED FROM THE HIGHER OF SEA OR SWELL WHEN BOTH WERE REPORTED.

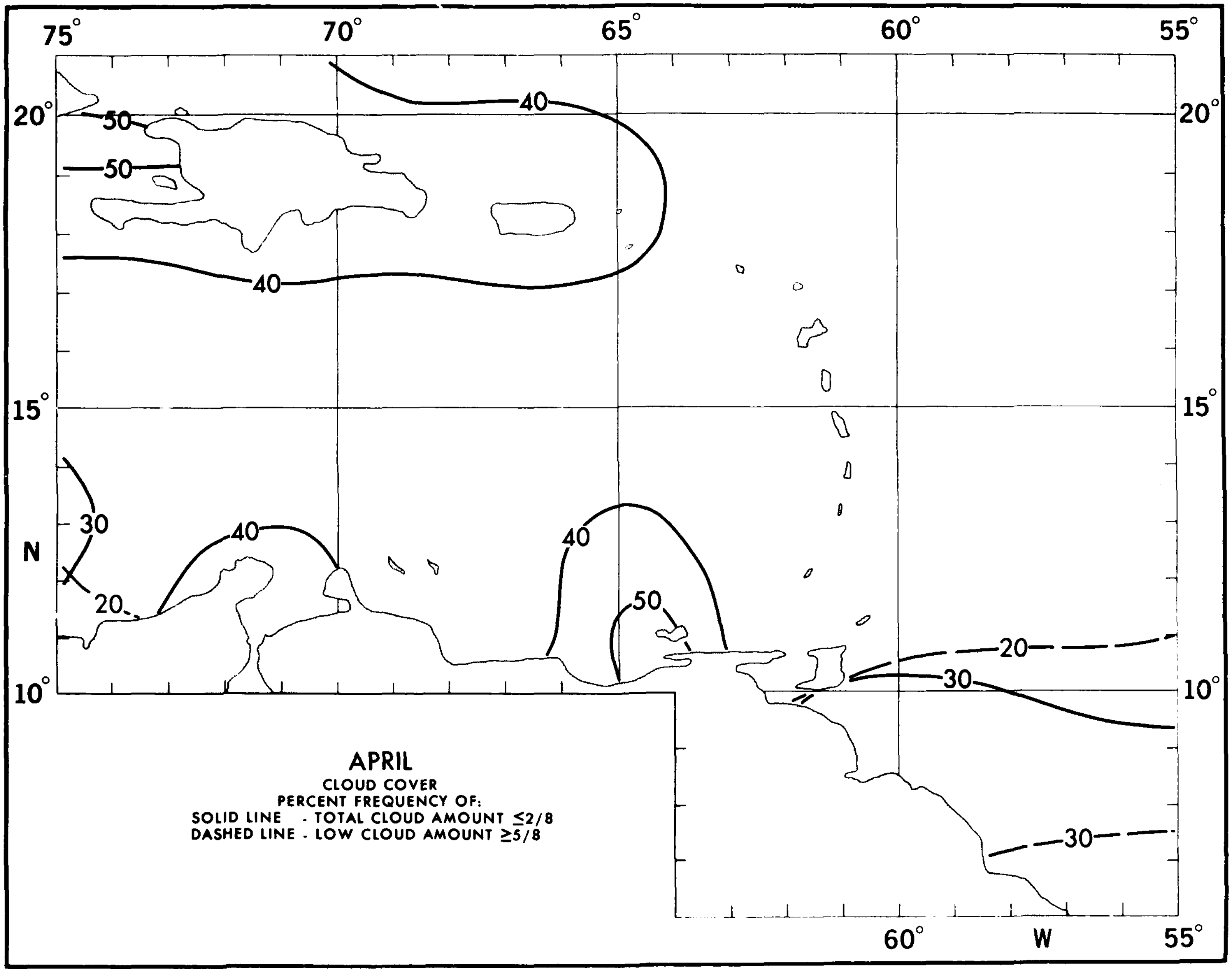

65°
60°
55°
20°
15°
10°
N
W
MARCH
WAVE HEIGHT-FREQUENCIES

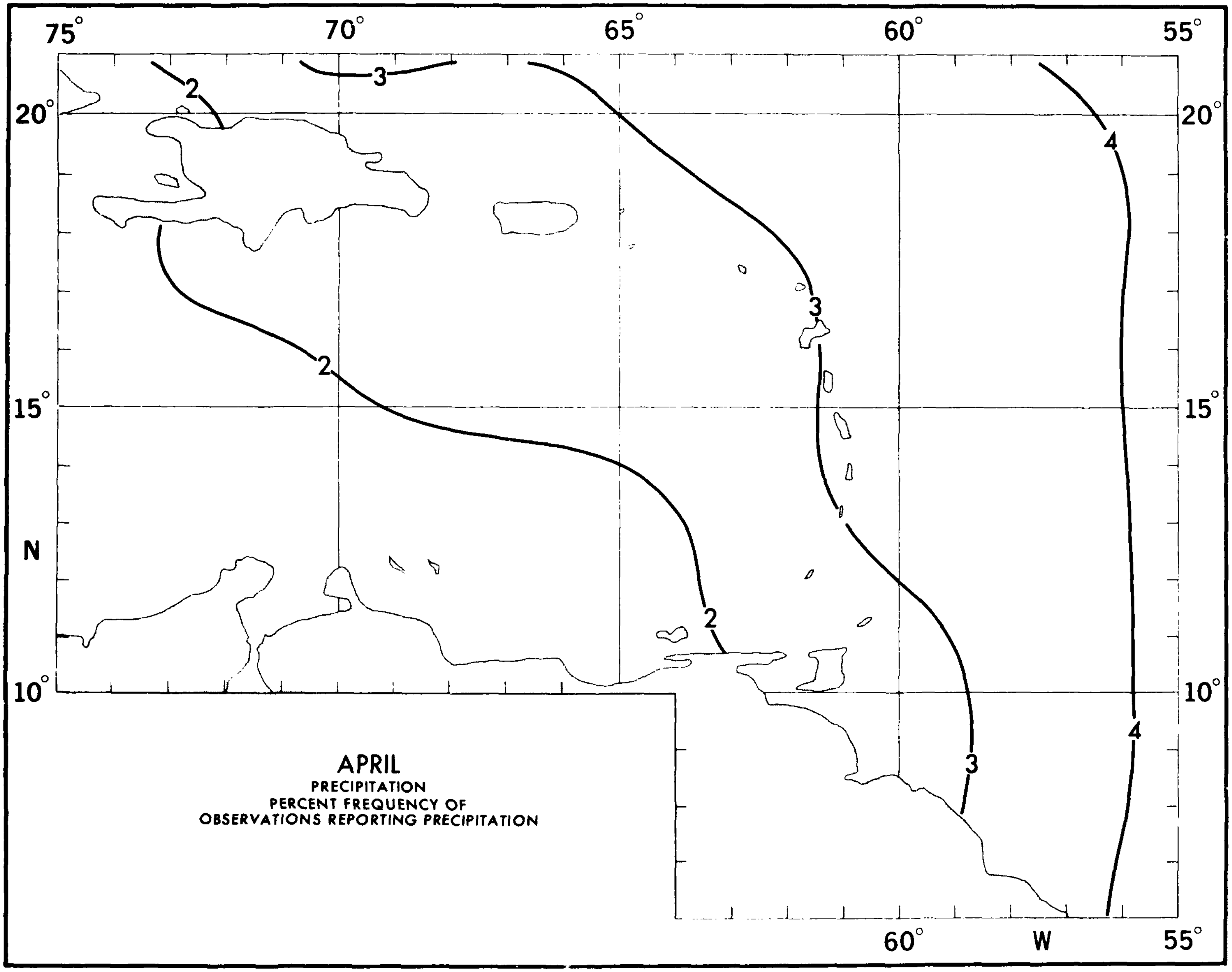


APRIL
CLOUD COVER
PERCENT FREQUENCY OF:
SOLID LINE - TOTAL CLOUD AMOUNT $\leq 2/8$
DASHED LINE - LOW CLOUD AMOUNT $\geq 5/8$

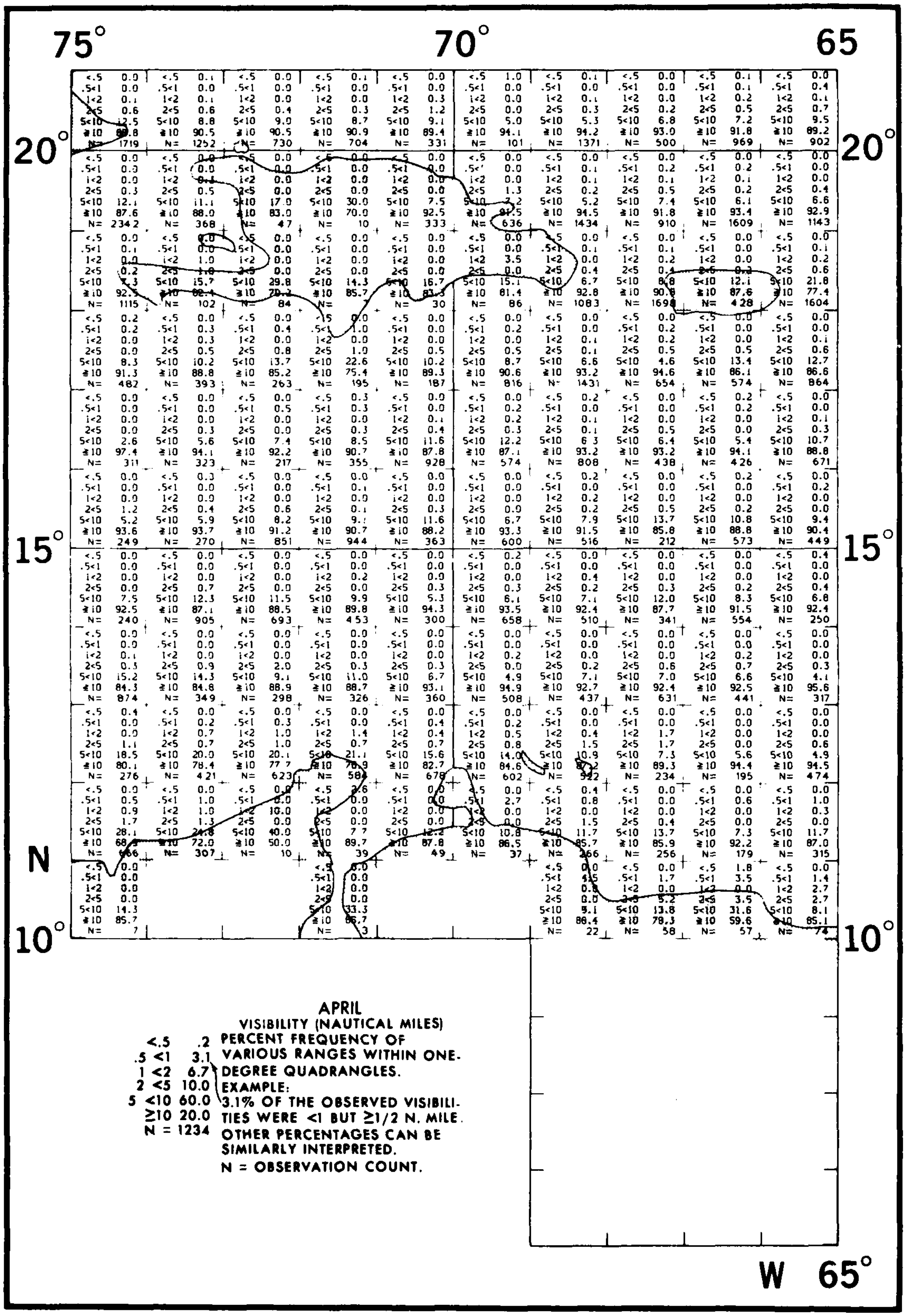


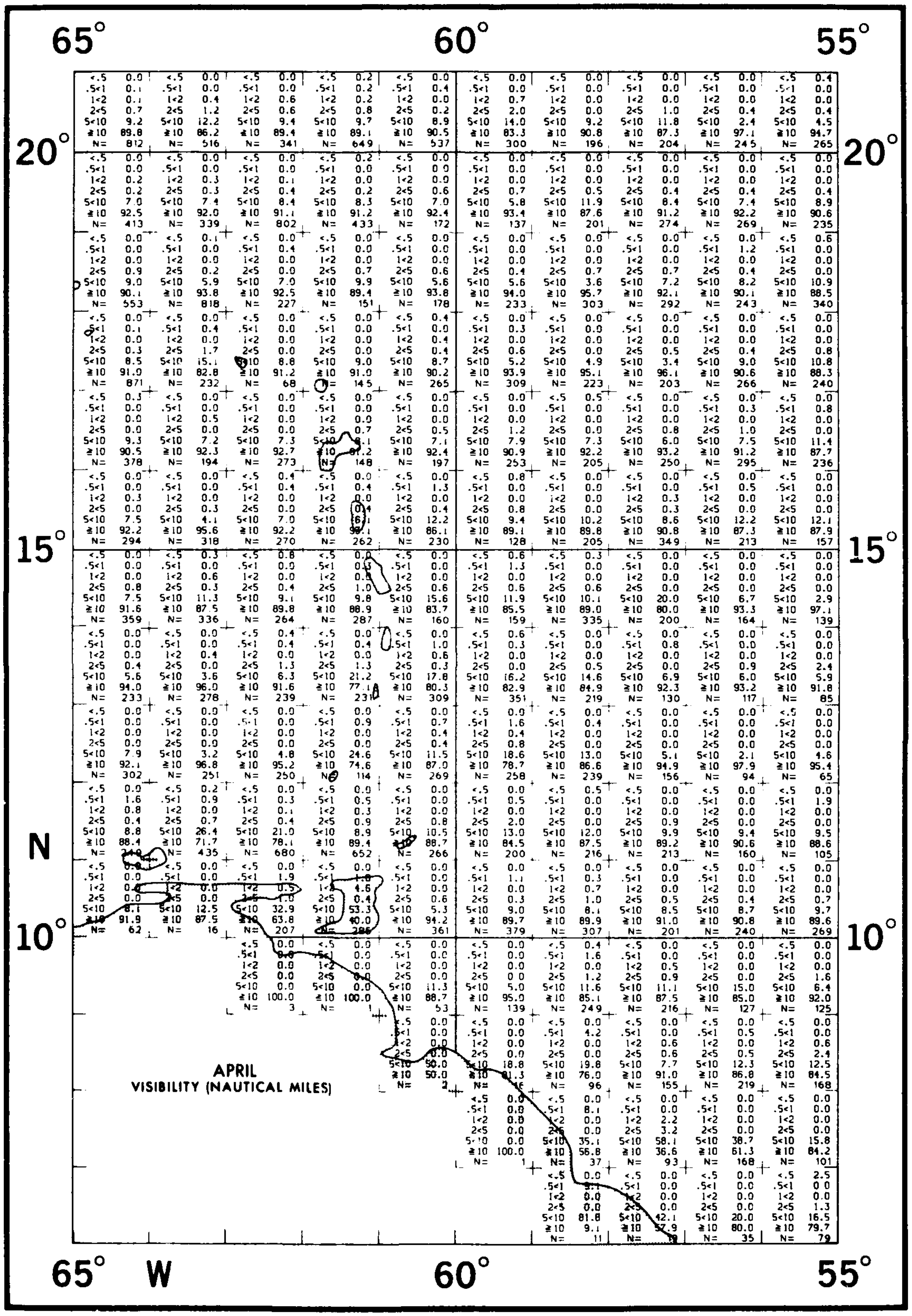
65°
60°
55°
20°
15°
10°
N
65° W
60°
55°
MARCH
WAVE HEIGHT-FREQUENCIES

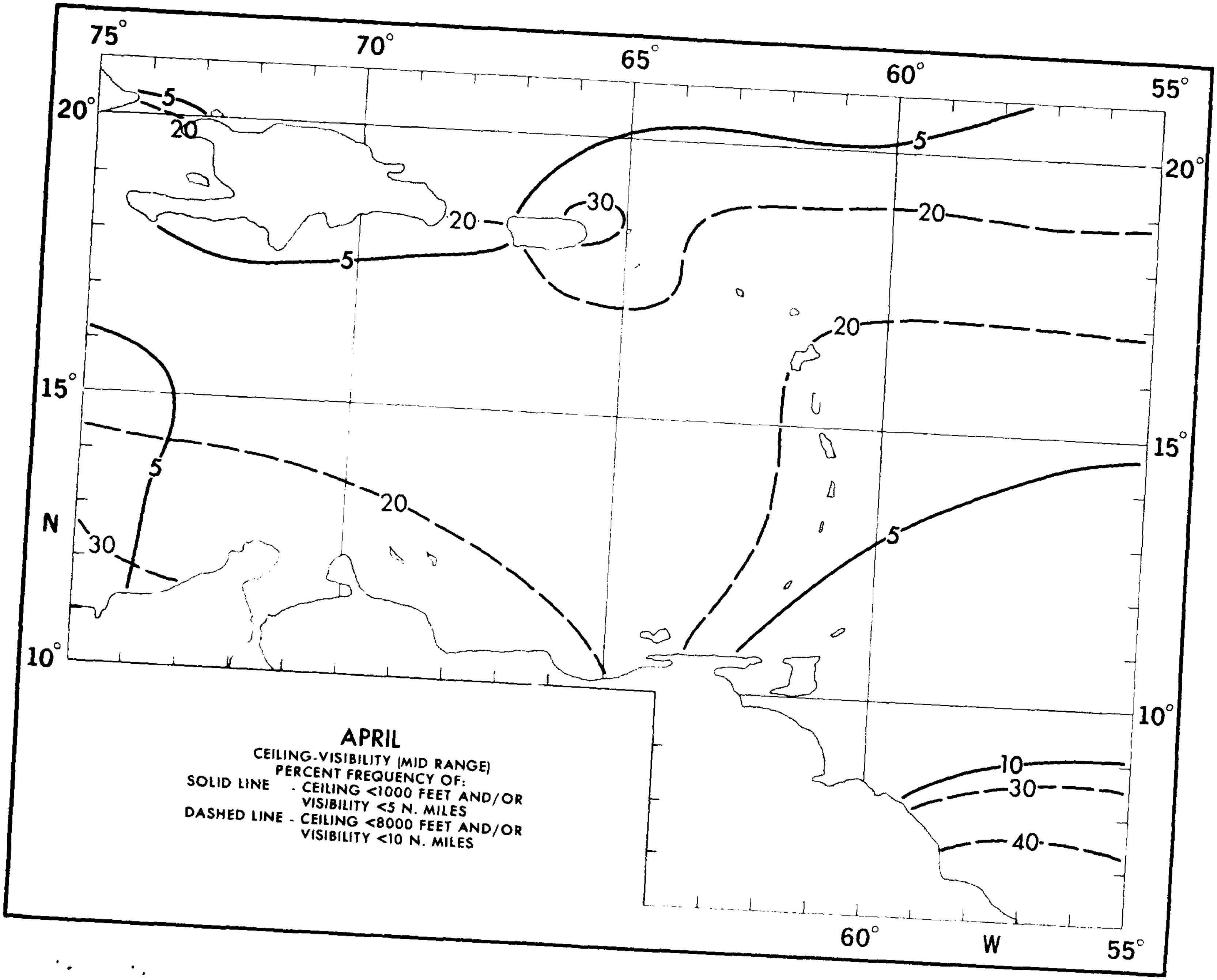

75°
70°
65°
60°
55°
20°
15°
10°
N
W
50
50
40
40
30
20
40
40
50
20
30
30
APRIL
CLOUD COVER
PERCENT FREQUENCY OF:
SOLID LINE - TOTAL CLOUD AMOUNT ≤2/8
DASHED LINE - LOW CLOUD AMOUNT ≥5/8

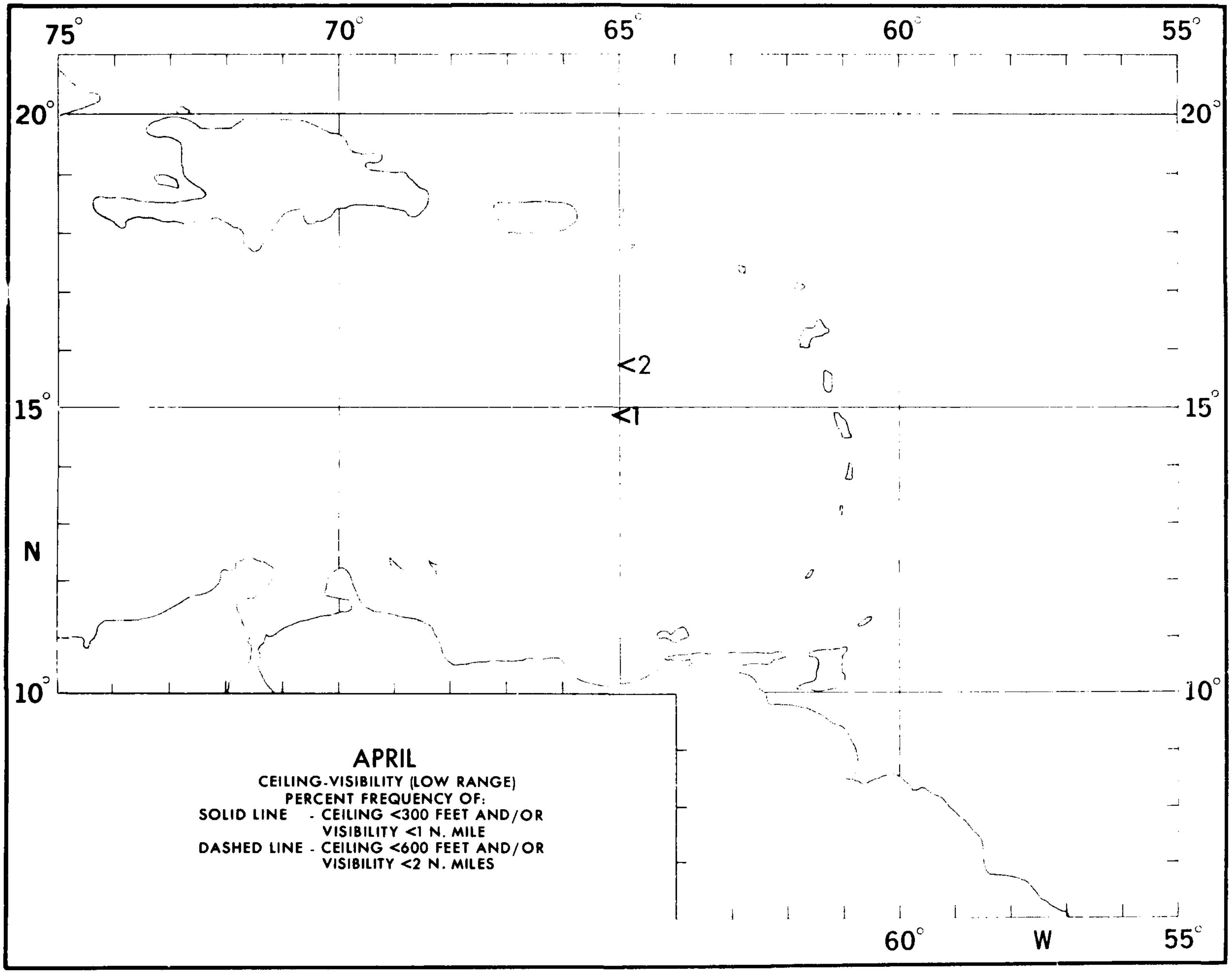


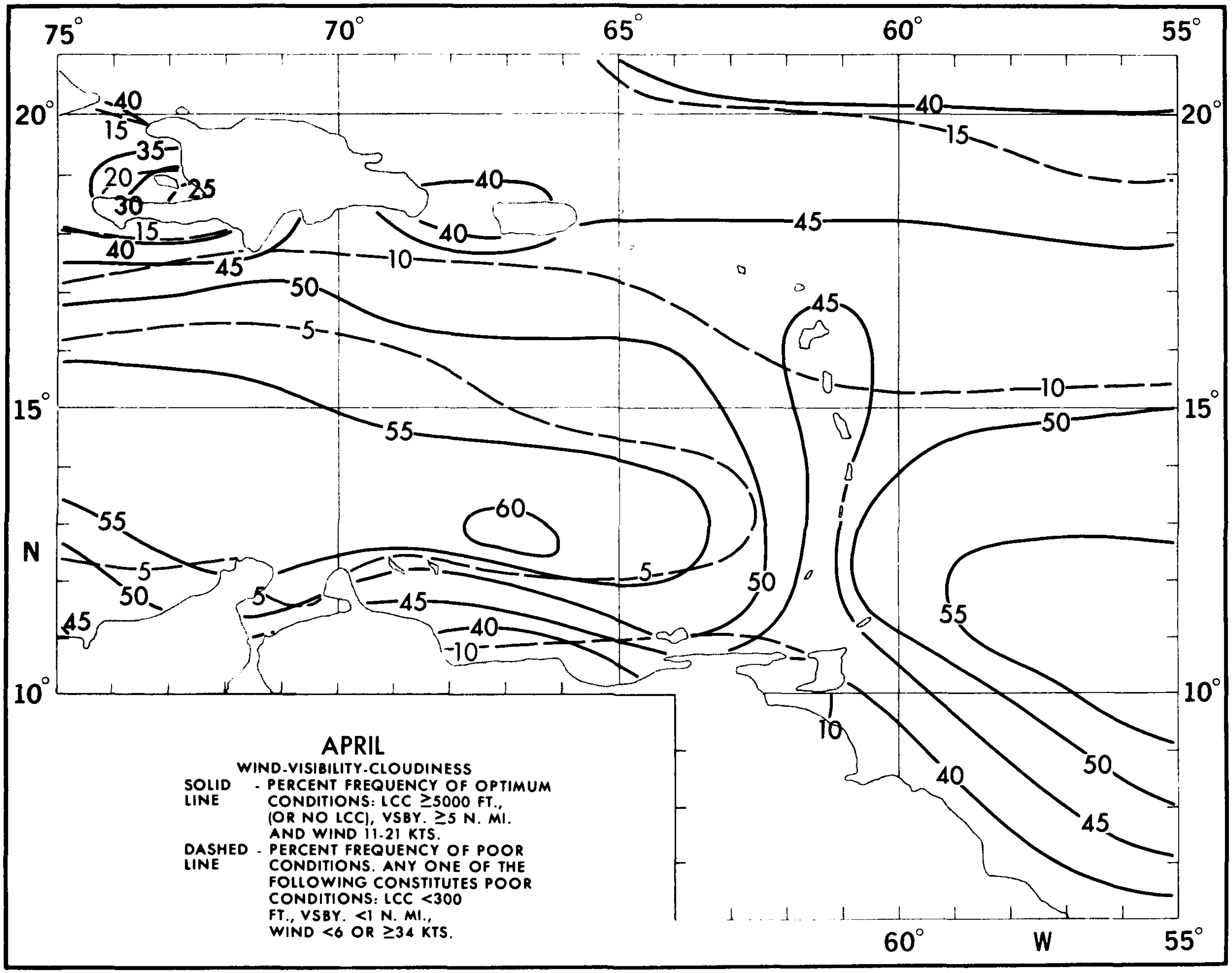
APRIL
PRECIPITATION
PERCENT FREQUENCY OF
OBSERVATIONS REPORTING PRECIPITATION

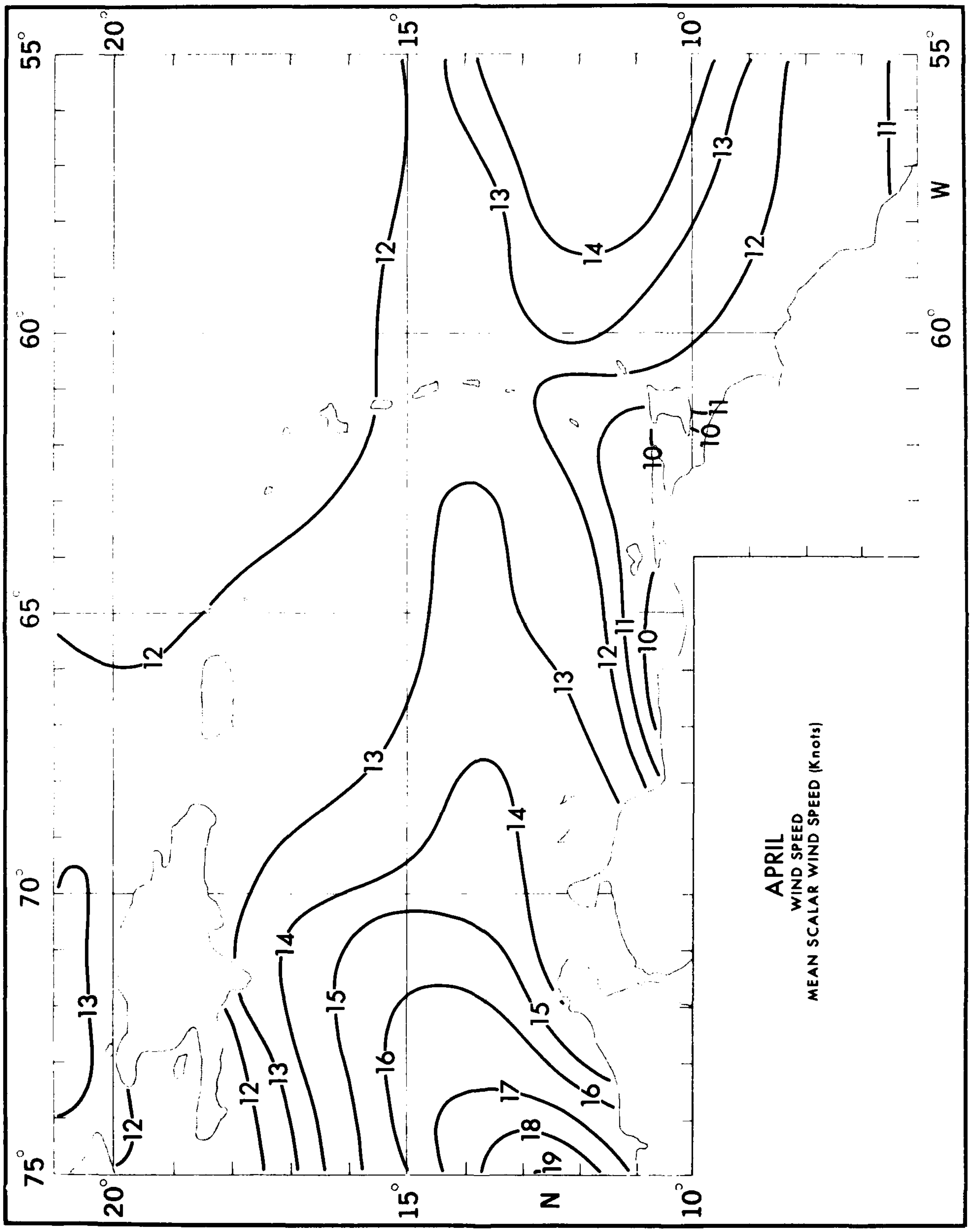

75°
70°
65
20°
15°
N
10°
W 65°
APRIL
VISIBILITY (NAUTICAL MILES)
<.5 .2
.5 <1 3.1
1 <2 6.7
2 <5 10.0
5 <10 60.0
≥10 20.0
N = 1234
PERCENT FREQUENCY OF VARIOUS RANGES WITHIN ONE-DEGREE QUADRANGLES.
EXAMPLE:
3.1% OF THE OBSERVED VISIBILITIES WERE <1 BUT ≥1/2 N. MILE.
OTHER PERCENTAGES CAN BE SIMILARLY INTERPRETED.
N = OBSERVATION COUNT.

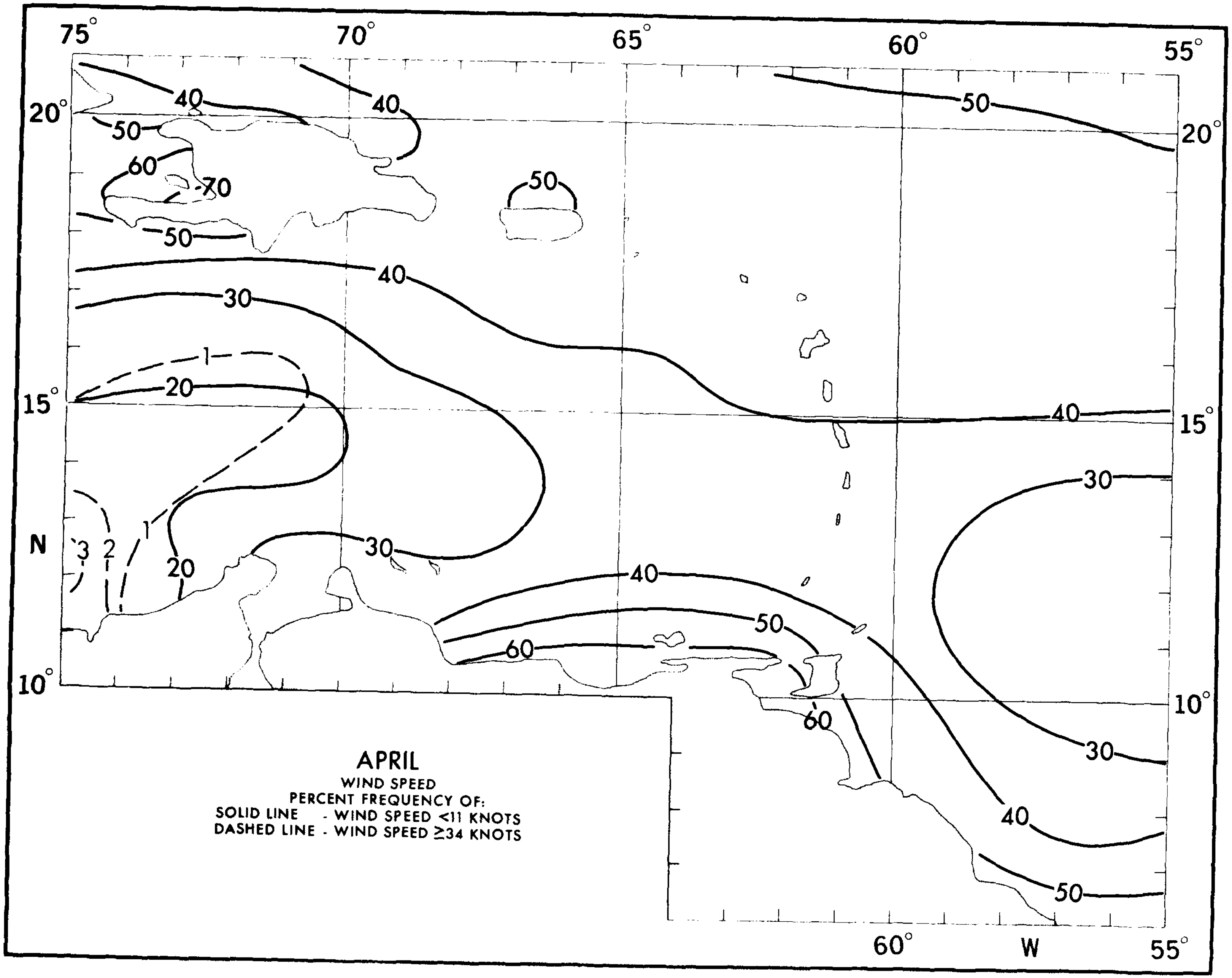

65°
60°
55°
20°
15°
N
10°
65° W
APRIL
VISIBILITY (NAUTICAL MILES)

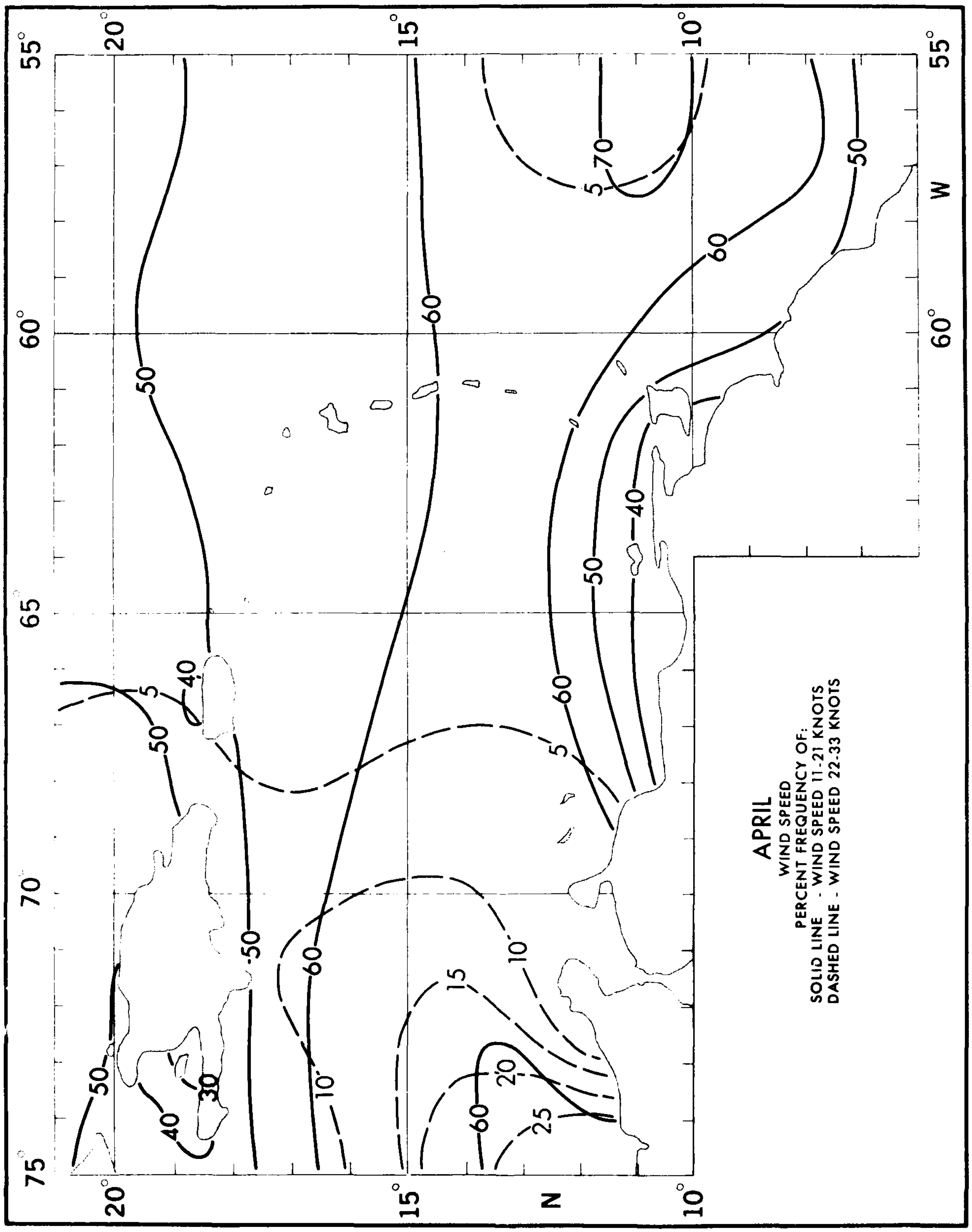

APRIL
CEILING-VISIBILITY (MID RANGE)
PERCENT FREQUENCY OF:
SOLID LINE - CEILING <1000 FEET AND/OR VISIBILITY <5 N. MILES
DASHED LINE - CEILING <8000 FEET AND/OR VISIBILITY <10 N. MILES
75°
70°
65°
60°
55°
20°
15°
10°
N
W
5
20
30
10
40

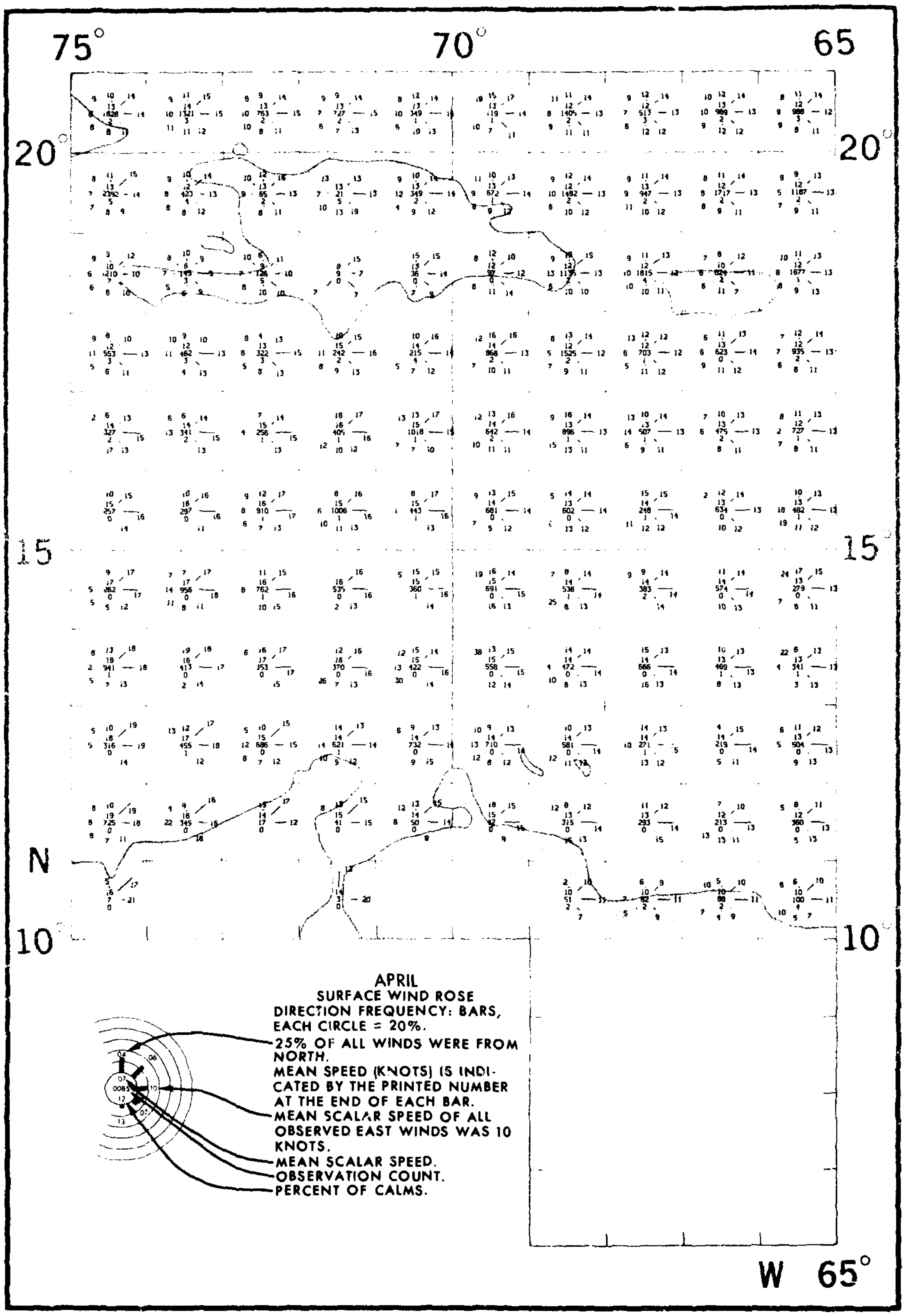

75°
70°
65°
60°
55°
20°
15°
10°
N
W
<2
<1
APRIL
CEILING-VISIBILITY (LOW RANGE)
PERCENT FREQUENCY OF:
SOLID LINE - CEILING <300 FEET AND/OR
VISIBILITY <1 N. MILE
DASHED LINE - CEILING <600 FEET AND/OR
VISIBILITY <2 N. MILES


APRIL
WIND-VISIBILITY-CLOUDINESS
SOLID LINE - PERCENT FREQUENCY OF OPTIMUM CONDITIONS: LCC ≥5000 FT., (OR NO LCC), VSBY. ≥5 N. MI. AND WIND 11-21 KTS.
DASHED LINE - PERCENT FREQUENCY OF POOR CONDITIONS. ANY ONE OF THE FOLLOWING CONSTITUTES POOR CONDITIONS: LCC <300 FT., VSBY. <1 N. MI., WIND <6 OR ≥34 KTS.
75°
70°
65°
60°
55°
20°
15°
10°
N
W

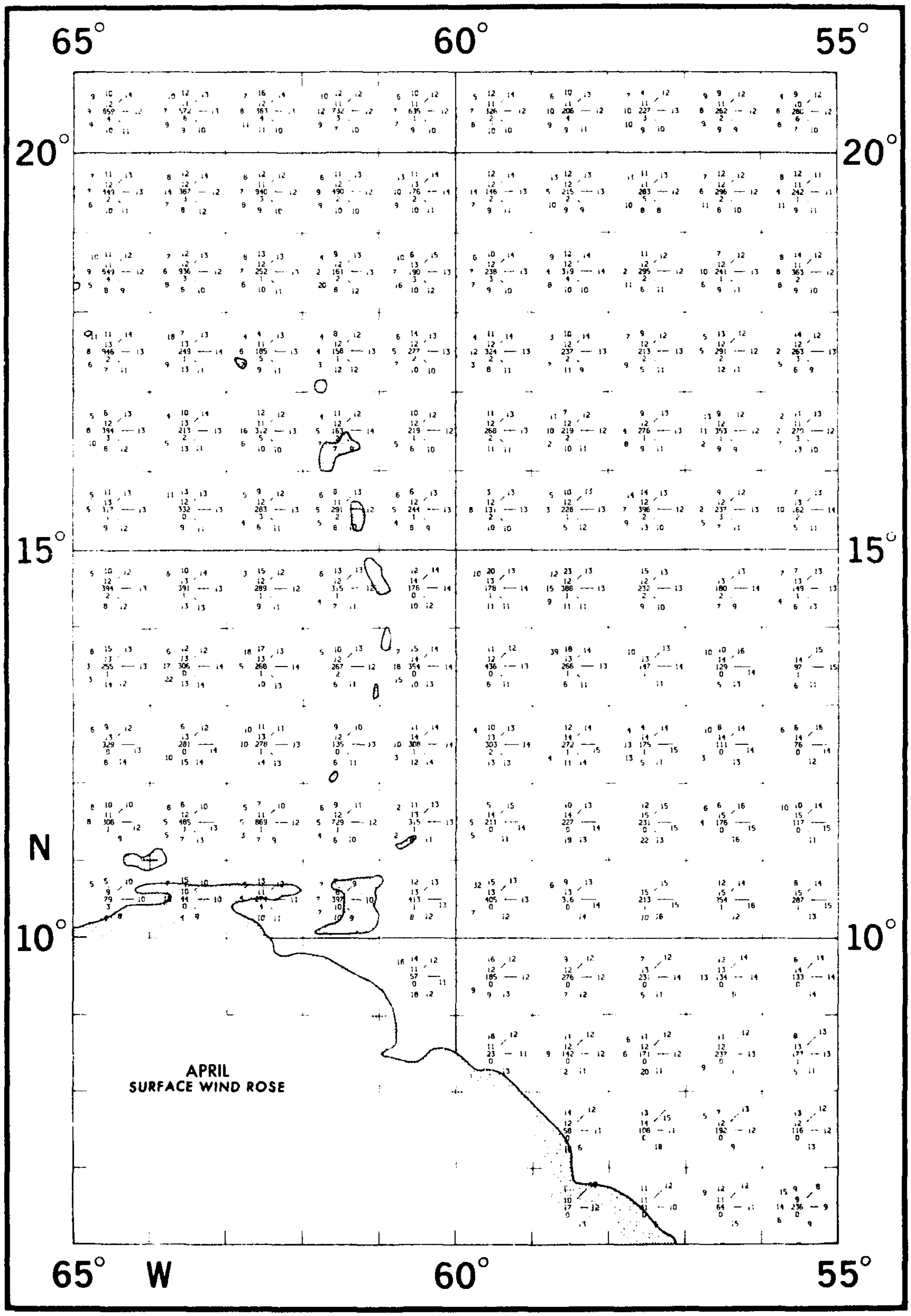

APRIL
WIND SPEED
MEAN SCALAR WIND SPEED (Knots)
75°
70°
65°
60°
55°
W
20°
15°
10°
N


APRIL
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE - WIND SPEED <11 KNOTS
DASHED LINE - WIND SPEED ≥34 KNOTS
75°
70°
65°
60°
55°
20°
15°
10°
N
W

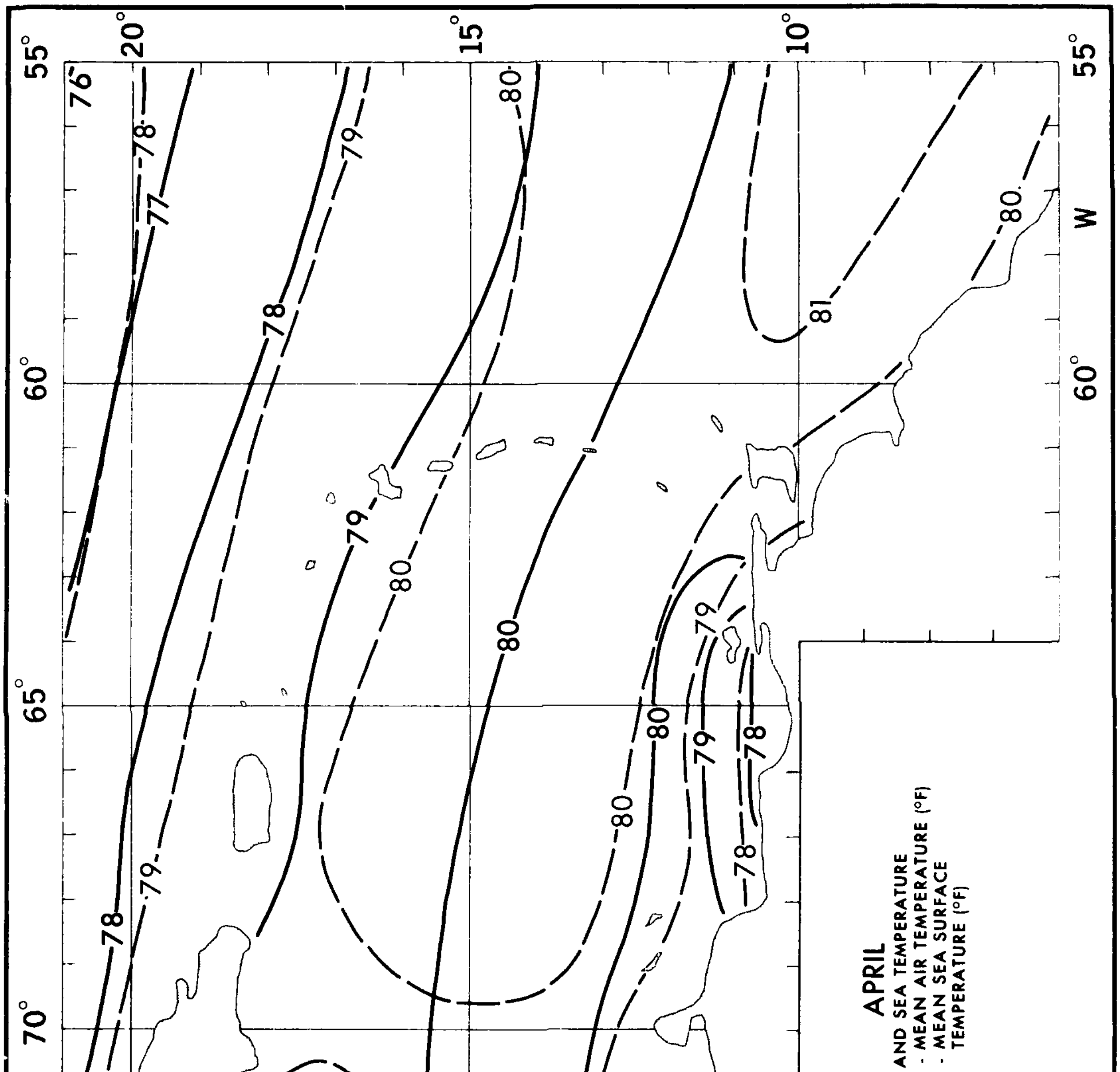

APRIL
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE - WIND SPEED 11-21 KNOTS
DASHED LINE - WIND SPEED 22-33 KNOTS
55°
60°
65°
70°
75°
20°
15°
10°
N
W

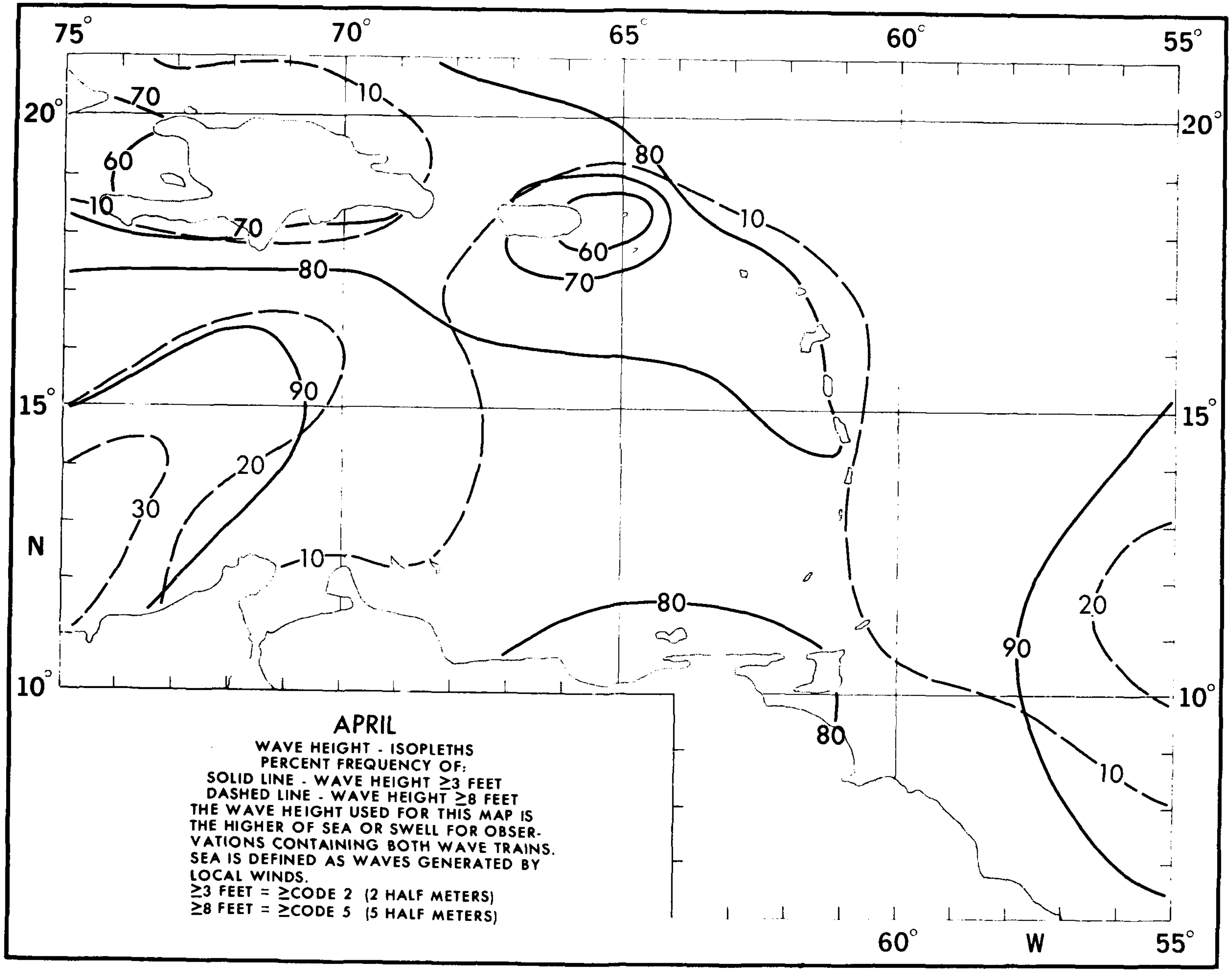


75°
70°
65
20°
20°
15
15°
N
10°
10°
W 65°
APRIL
SURFACE WIND ROSE
DIRECTION FREQUENCY: BARS, EACH CIRCLE = 20%.
25% OF ALL WINDS WERE FROM NORTH.
MEAN SPEED (KNOTS) IS INDICATED BY THE PRINTED NUMBER AT THE END OF EACH BAR.
MEAN SCALAR SPEED OF ALL OBSERVED EAST WINDS WAS 10 KNOTS.
MEAN SCALAR SPEED.
OBSERVATION COUNT.
PERCENT OF CALMS.



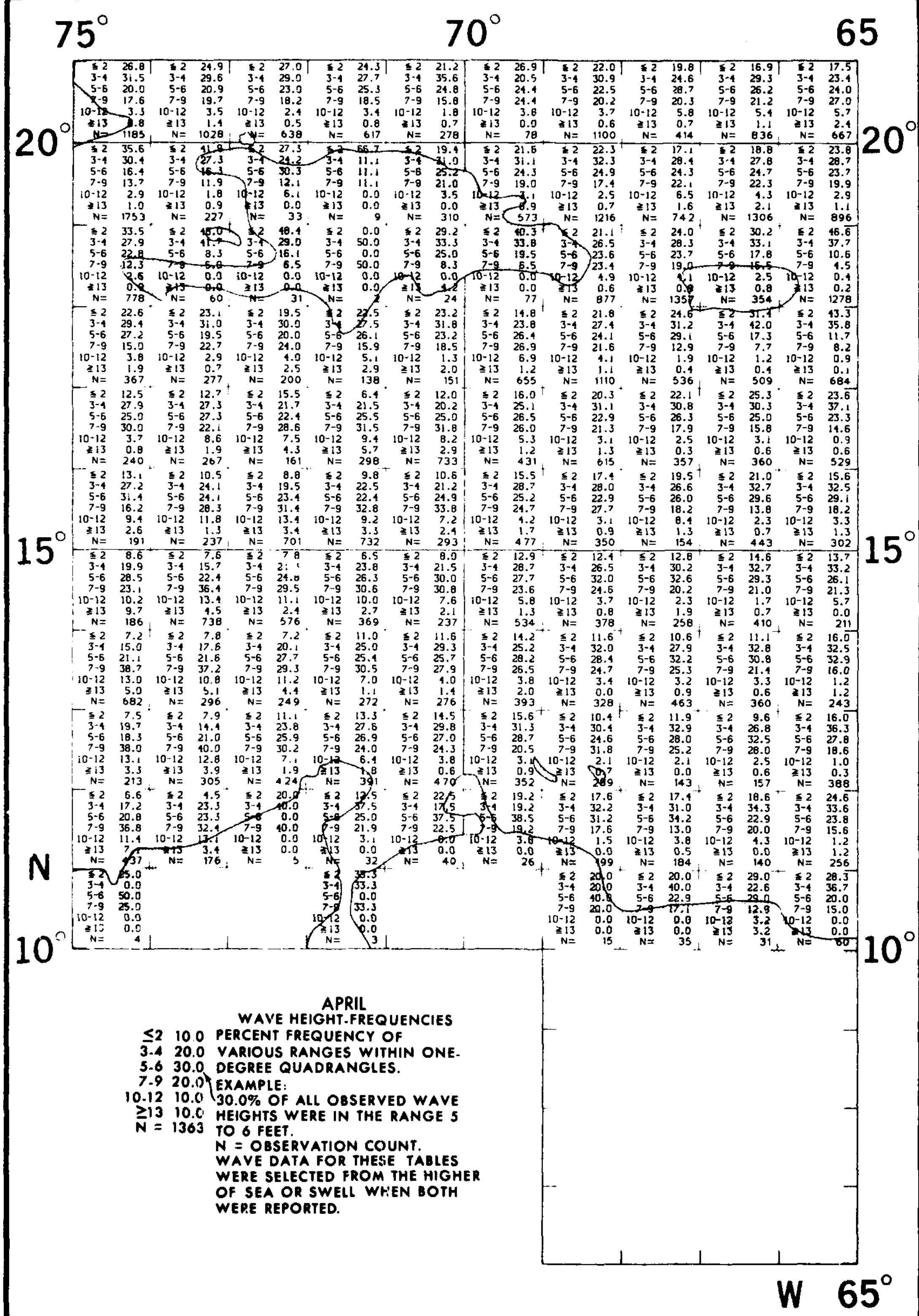
65°
60°
55°
20°
15°
10°
N
W
APRIL
SURFACE WIND ROSE


APRIL
AIR AND SEA TEMPERATURE
SOLID LINE - MEAN AIR TEMPERATURE (°F)
DASHED LINE - MEAN SEA SURFACE TEMPERATURE (°F)
N
W
75°
70°
65°
60°
55°
20°
15°
10°



APRIL

WAVE HEIGHT - ISOPLETHS
PERCENT FREQUENCY OF:
SOLID LINE - WAVE HEIGHT ≥3 FEET
DASHED LINE - WAVE HEIGHT ≥8 FEET
THE WAVE HEIGHT USED FOR THIS MAP IS THE HIGHER OF SEA OR SWELL FOR OBSERVATIONS CONTAINING BOTH WAVE TRAINS. SEA IS DEFINED AS WAVES GENERATED BY LOCAL WINDS.
≥3 FEET = ≥CODE 2 (2 HALF METERS)
≥8 FEET = ≥CODE 5 (5 HALF METERS)



APRIL

WAVE HEIGHT-FREQUENCIES

≤2	10.0
3-4	20.0
5-6	30.0
7-9	20.0
10-12	10.0
≥13	10.0
N =	1363

PERCENT FREQUENCY OF VARIOUS RANGES WITHIN ONE-DEGREE QUADRANGLES.

EXAMPLE: 30.0% OF ALL OBSERVED WAVE HEIGHTS WERE IN THE RANGE 5 TO 6 FEET.

N = OBSERVATION COUNT.

WAVE DATA FOR THESE TABLES WERE SELECTED FROM THE HIGHER OF SEA OR SWELL WHEN BOTH WERE REPORTED.

65° 60° 55°

≤2	17.3	15.9	17.0	14.5	16.1	15.5	15.6	12.5	14.0	18.3
3-4	26.5	25.5	24.8	26.2	30.3	22.3	23.8	22.0	23.8	20.1
5-6	24.2	26.3	27.0	26.2	21.3	23.6	32.0	30.4	23.4	27.9
7-9	24.6	23.1	23.3	26.0	22.6	33.9	21.1	25.6	31.3	26.9
10-12	5.5	6.0	3.3	5.5	6.5	4.3	6.8	5.4	7.5	6.4
≥13	1.9	3.1	4.4	1.5	3.2	0.4	0.7	4.2	0.0	0.5
N=	641	415	270	469	403	233	147	168	214	219

20°

≤2	23.0	14.9	13.2	14.9	10.6	11.9	12.0	17.8	14.8	13.5
3-4	26.6	27.2	25.2	24.5	28.8	15.6	25.9	26.2	22.7	30.2
5-6	22.1	29.1	27.5	24.8	28.8	21.1	29.7	24.0	31.9	24.5
7-9	23.3	22.4	26.0	26.0	25.0	40.4	22.2	26.2	24.1	26.0
10-12	4.5	5.6	6.5	6.2	6.1	4.6	6.3	4.4	5.6	5.7
≥13	0.6	0.7	1.6	3.7	0.8	6.4	3.8	1.3	0.9	0.0
N=	331	268	612	323	132	109	158	225	216	192

≤2	51.6	17.6	13.7	12.6	12.4	12.1	10.0	14.4	14.5	11.8
3-4	22.6	29.2	22.6	24.4	20.7	28.5	26.8	21.2	25.5	21.5
5-6	12.6	27.1	36.9	29.4	24.1	28.0	26.8	32.2	31.0	32.1
7-9	11.6	20.2	17.9	23.5	35.2	24.6	32.7	26.7	24.0	27.2
10-12	1.1	5.1	6.5	8.4	6.2	5.8	1.9	4.2	3.0	5.3
≥13	0.5	0.8	2.4	1.7	1.4	1.0	1.9	1.3	2.0	2.0
N=	372	609	168	119	145	207	269	236	200	246

≤2	30.0	17.3	36.7	12.5	15.5	12.6	13.8	10.4	11.3	11.4
3-4	36.4	35.8	28.6	24.1	21.8	22.2	30.7	23.9	28.2	30.3
5-6	18.0	31.2	18.4	19.6	30.6	33.7	27.0	42.3	32.3	31.9
7-9	13.5	13.9	16.3	39.3	28.5	26.8	23.8	17.2	23.1	21.1
10-12	1.6	1.7	0.0	2.7	3.1	4.6	2.6	6.1	4.6	3.8
≥13	0.4	0.0	0.0	1.8	0.5	0.0	2.1	0.0	0.5	1.6
N=	679	173	49	112	193	261	189	163	195	185

≤2	27.3	21.8	21.8	20.8	13.1	15.4	12.9	10.5	6.8	16.7
3-4	36.3	28.2	32.0	32.8	29.7	23.9	27.0	23.8	27.9	25.9
5-6	22.5	27.1	26.7	20.0	30.3	31.8	35.0	30.8	34.7	24.1
7-9	11.1	18.2	18.2	24.8	22.1	22.4	22.7	26.7	22.6	27.8
10-12	2.4	3.5	0.9	[illegible]	4.8	5.5	2.5	7.6	6.3	4.3
≥13	0.3	1.2	0.4	0.8	0.0	1.0	0.0	0.6	1.6	1.2
N=	289	170	225	125	145	201	16[illegible]	172	190	162

≤2	22.0	17.4	24.7	22.8	17.4	11.7	8.9	11.5	17.3	13.6
3-4	33.1	34.7	35.3	31.6	28.4	38.3	25.9	26.9	20.9	33.1
5-6	22.0	29.4	26.5	28.9	23.2	21.3	25.9	27.3	20.9	21.2
7-9	19.5	17.0	12.6	13.2	25.3	22.3	30.4	26.0	37.4	21.2
10-12	3.0	1.5	0.9	2.2	4.7	4.3	8.9	7.5	3.6	10.2
≥13	0.4	0.0	0.0	1.3	1.1	2.1	0.0	0.9	0.0	0.8
N=	236	265	215	228	190	94	135	227	139	118

15°

≤2	20.7	14.5	20.1	24.6	12.6	14.6	10.8	15.0	14.1	8.6
3-4	31.5	37.4	36.4	33.0	23.0	22.3	27.4	21.5	26.6	23.3
5-6	29.7	25.1	25.4	24.1	40.7	28.2	28.0	20.6	30.5	33.6
7-9	16.7	17.0	15.3	15.2	20.0	24.3	27.4	36.4	21.9	28.4
10-12	1.4	4.7	1.9	3.1	0.7	9.7	5.4	4.7	3.9	6.0
≥13	0.0	1.3	1.0	0.0	3.0	1.0	1.1	1.9	3.1	0.0
N=	276	235	209	224	135	103	186	107	128	116

≤2	15.8	14.2	14.0	18.5	11.2	13.0	16.3	10.2	9.0	13.1
3-4	33.3	40.5	32.8	30.2	25.7	28.0	26.4	19.4	20.2	23.0
5-6	30.1	25.0	30.6	25.3	28.6	32.1	24.0	24.5	38.2	29.5
7-9	16.4	18.1	17.2	23.5	28.2	21.8	24.8	43.9	23.6	27.9
10-12	3.8	2.2	4.8	1.9	5.3	4.7	7.8	2.0	7.9	1.6
≥13	0.5	0.0	0.5	0.6	1.0	0.5	0.8	0.0	1.1	4.9
N=	183	232	186	162	206	193	129	98	89	61

≤2	14.5	10.8	16.4	23.1	10.7	9.9	8.9	8.3	11.4	9.8
3-4	33.5	34.5	42.7	38.5	21.4	24.1	26.6	22.0	28.6	23.5
5-6	30.2	34.0	25.8	15.4	30.4	31.9	28.4	28.0	22.9	21.6
7-9	18.1	19.1	13.6	23.1	29.8	28.4	33.1	30.3	25.7	33.3
10-12	3.2	1.0	1.4	0.0	7.7	4.3	2.4	10.6	10.0	9.8
≥13	0.4	0.5	0.0	0.0	0.0	1.4	0.6	0.8	1.4	2.0
N=	248	194	213	65	168	141	169	132	70	51

N

≤2	26.5	23.5	18.8	19.9	13.4	8.1	13.2	8.2	4.0	10.6
3-4	32.0	34.0	35.9	32.1	23.7	23.0	19.9	24.1	23.0	21.2
5-6	23.8	27.6	31.3	31.1	27.3	32.4	29.1	27.6	33.3	29.4
7-9	14.4	12.7	13.3	14.3	26.3	27.7	30.5	35.3	32.5	32.9
10-12	3.3	1.5	0.4	2.4	6.2	6.8	5.3	3.5	4.8	4.7
≥13	0.0	0.7	0.2	0.2	3.1	2.0	2.0	1.2	2.4	1.2
N=	[illegible]	268	451	498	194	148	151	170	126	85

≤2	33.3	50.0	38.5	32.9	11.3	11.3	13.3	7.6	10.7	3.4
3-4	33.3	10.0	30.8	~~30.8~~	22.5	29.4	23.7	19.6	18.2	21.2
5-6	23.0	30.0	23.1	20.0	34.5	29.4	26.9	31.0	25.7	27.4
7-9	7.7	0.0	7.7	15.3	24.9	25.9	28.1	36.1	39.0	38.5
10-12	2.6	0.0	0.0	1.2	5.8	3.6	5.6	5.1	4.8	7.7
≥13	0.0	10.0	0.0	0.0	1.0	0.3	2.4	0.6	1.6	1.9
N=	39	10	39	~~89~~	293	309	249	158	187	208

10°

≤2			0.0		17.4	14.0	13.3	10.1	6.1	7.8
3-4			100.0		37.0	30.1	26.2	28.5	23.5	24.5
5-6			0.0		30.4	32.3	34.9	30.2	32.7	30.4
7-9			0.0		13.0	22.6	22.1	25.1	28.6	29.4
10-12			0.0		2.2	1.1	2.1	5.6	9.2	5.9
≥13			0.0		0.0	0.0	1.5	0.6	0.0	2.0
N=			1		46	93	195	179	98	102

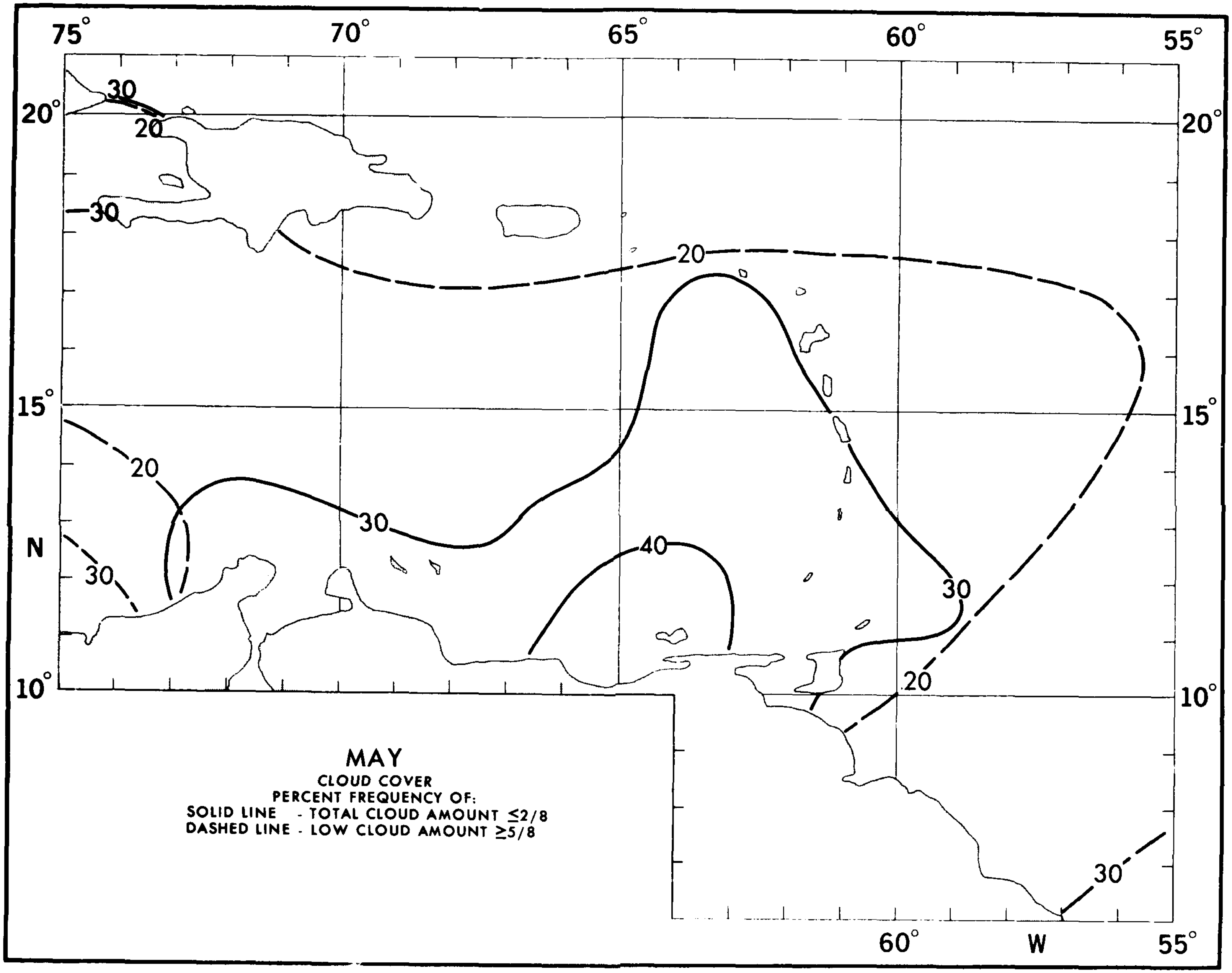
≤2					50.0	25.0	4.7	9.3	12.1	11.6
3-4					0.0	8.3	32.8	25.6	30.5	21.7
5-6					0.0	33.3	43.8	38.8	35.1	35.7
7-9					[illegible]	33.3	15.6	21.7	20.1	26.4
10-12					0.0	0.0	3.1	4.7	2.3	2.3
≥13					0.0	0.0	0.0	0.0	0.0	2.3
N=					2	12	64	129	174	129

≤2						0.0	0.0	3.9	5.3	11.2
3-4						100.0	30.0	13.0	20.5	25.0
5-6						0.0	60.0	39.0	30.5	41.2
7-9						0.0	10.0	41.6	41.1	15.0
10-12						0.0	0.0	2.6	2.6	5.0
≥13						0.0	0.0	0.0	0.0	2.5
N=						1	10	77	151	80

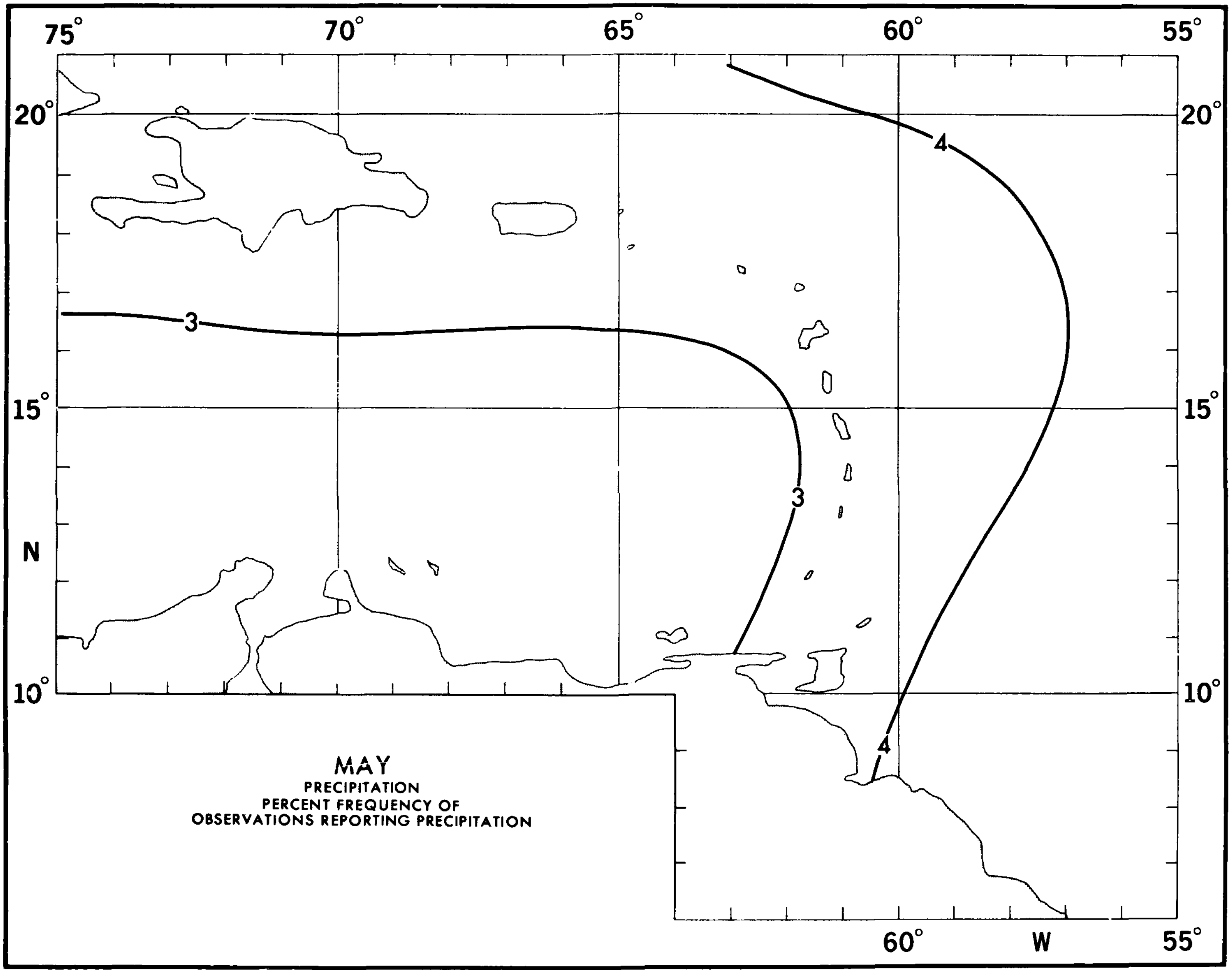
≤2							100.0	33.3	26.1	9.1
3-4							0.0	0.0	21.7	36.4
5-6							0.0	66.7	30.4	27.3
7-9							0.0	0.0	21.7	20.5
10-12							0.0	0.0	0.0	4.5
≥13							0.0	0.0	0.0	2.3
N=							2	[illegible]	23	44

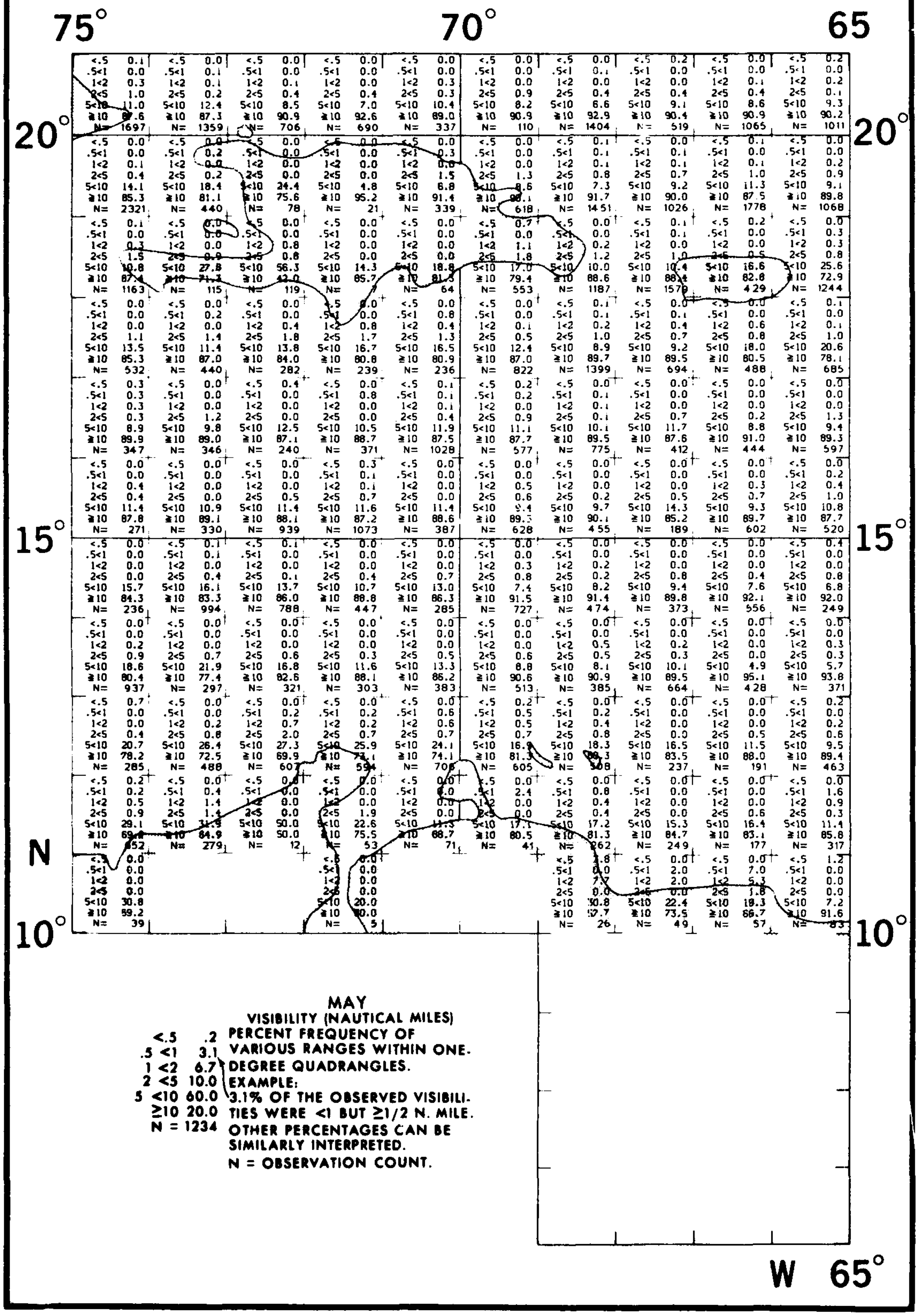
APRIL
WAVE HEIGHT-FREQUENCIES

65° W 60° 55°



MAY
CLOUD COVER
PERCENT FREQUENCY OF:
SOLID LINE - TOTAL CLOUD AMOUNT ≤2/8
DASHED LINE - LOW CLOUD AMOUNT ≥5/8

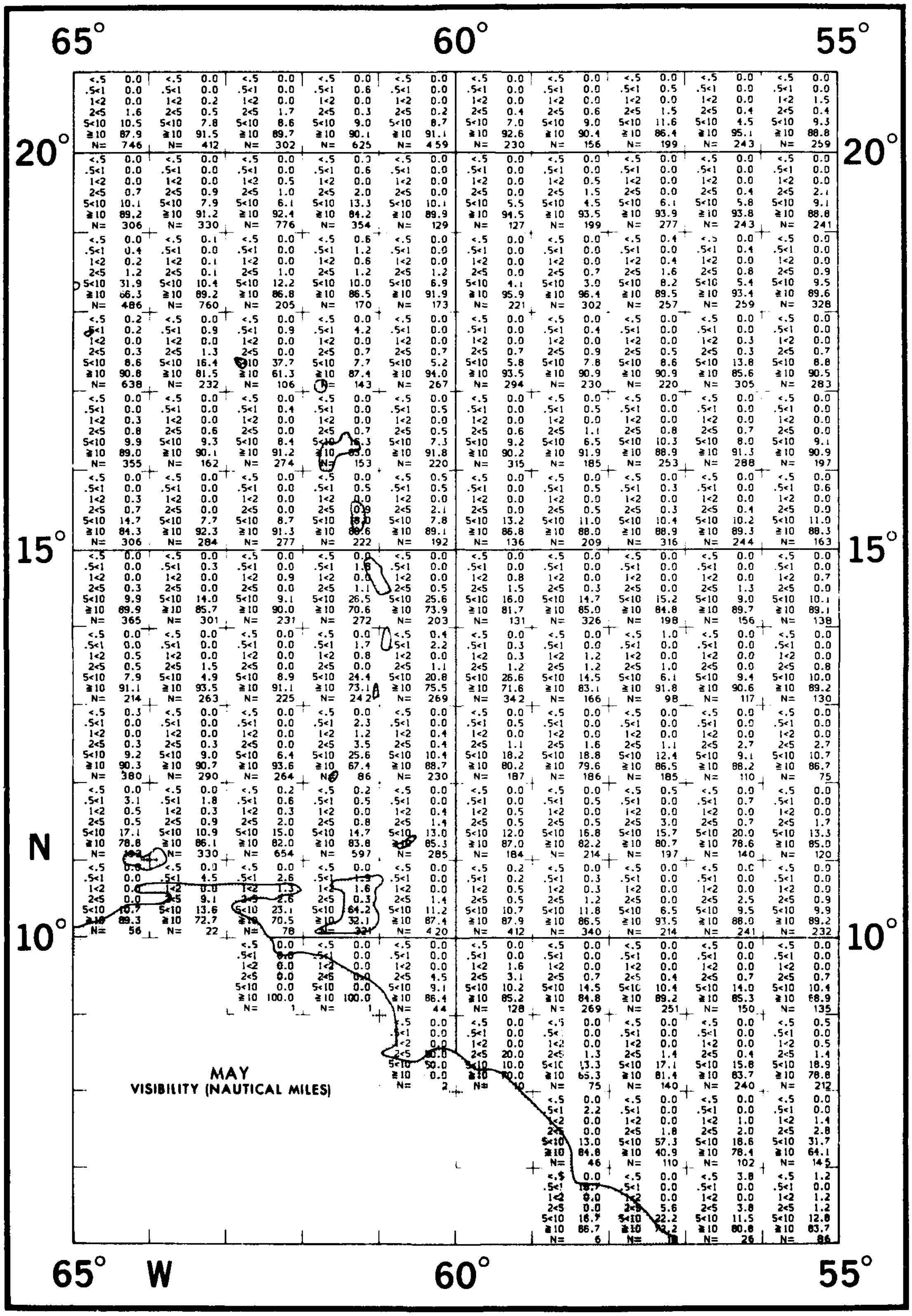

75°
70°
65°
60°
55°
20°
15°
10°
N
W
3
4
MAY
PRECIPITATION
PERCENT FREQUENCY OF
OBSERVATIONS REPORTING PRECIPITATION

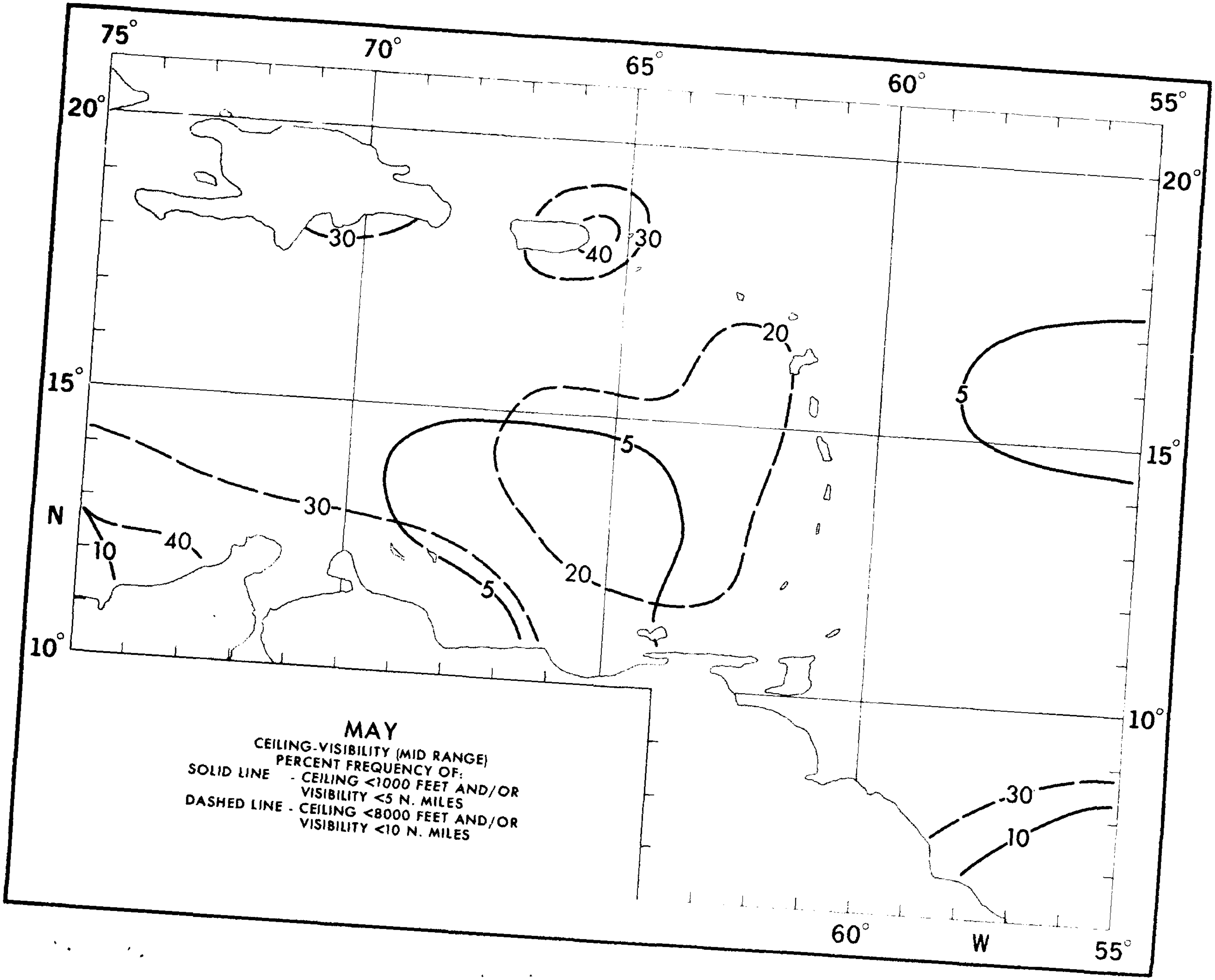


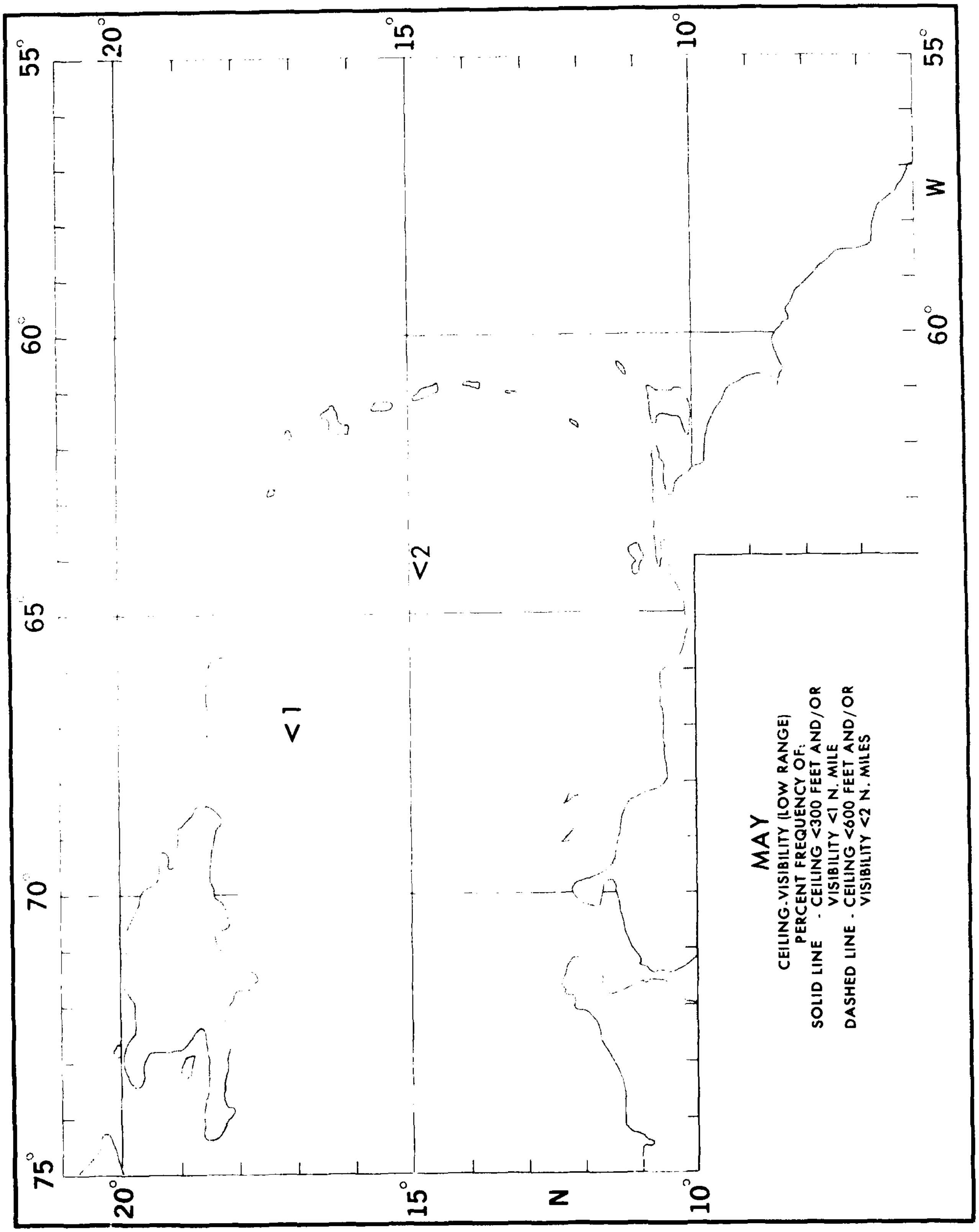
MAY

VISIBILITY (NAUTICAL MILES)

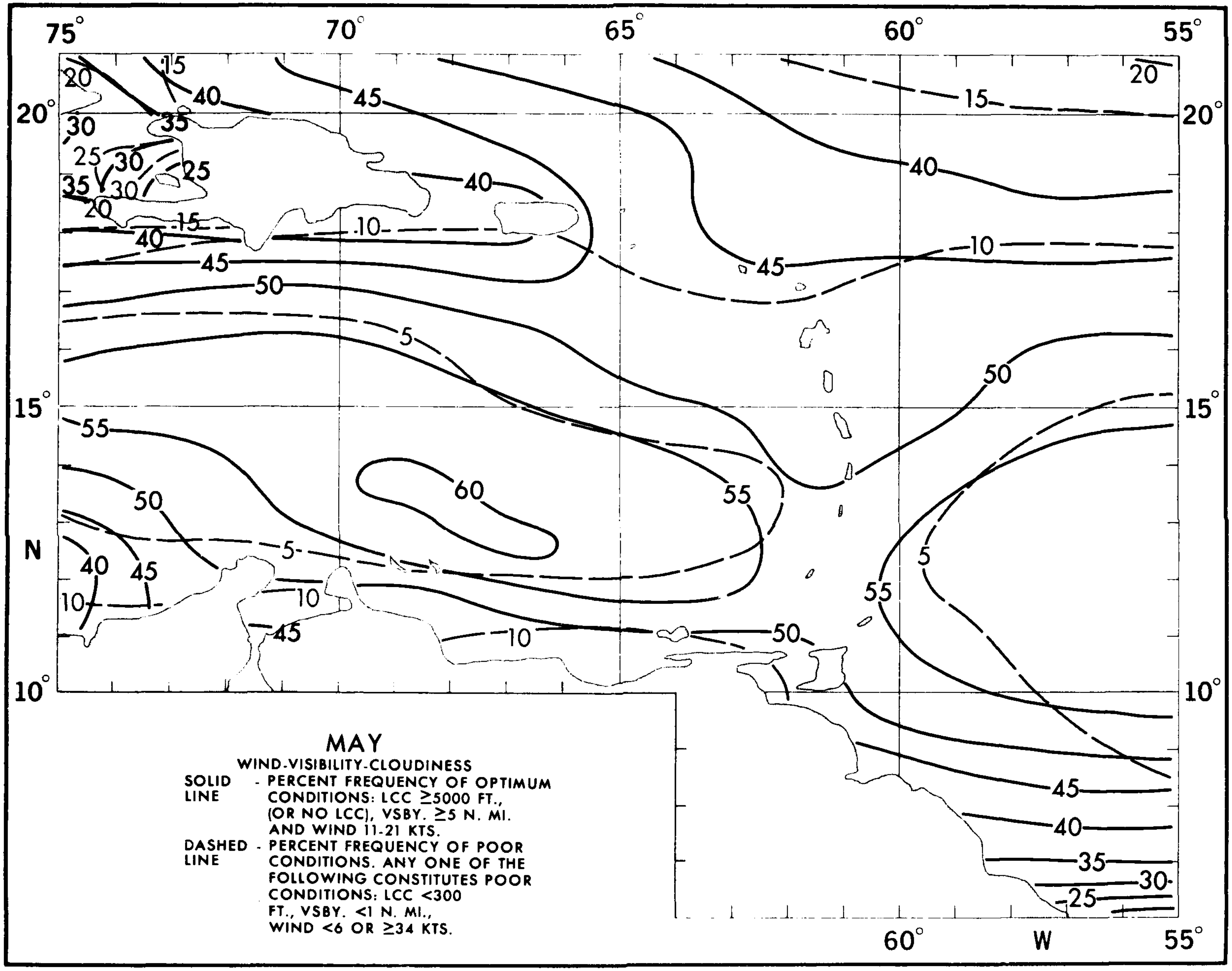
<.5	.2	PERCENT FREQUENCY OF
.5 <1	3.1	VARIOUS RANGES WITHIN ONE-
1 <2	6.7	DEGREE QUADRANGLES.
2 <5	10.0	EXAMPLE:
5 <10	60.0	3.1% OF THE OBSERVED VISIBILI-
≥10	20.0	TIES WERE <1 BUT ≥1/2 N. MILE.
N = 1234		OTHER PERCENTAGES CAN BE
		SIMILARLY INTERPRETED.
		N = OBSERVATION COUNT.


65°
60°
55°
20°
15°
10°
N
65° W
60°
55°
MAY
VISIBILITY (NAUTICAL MILES)

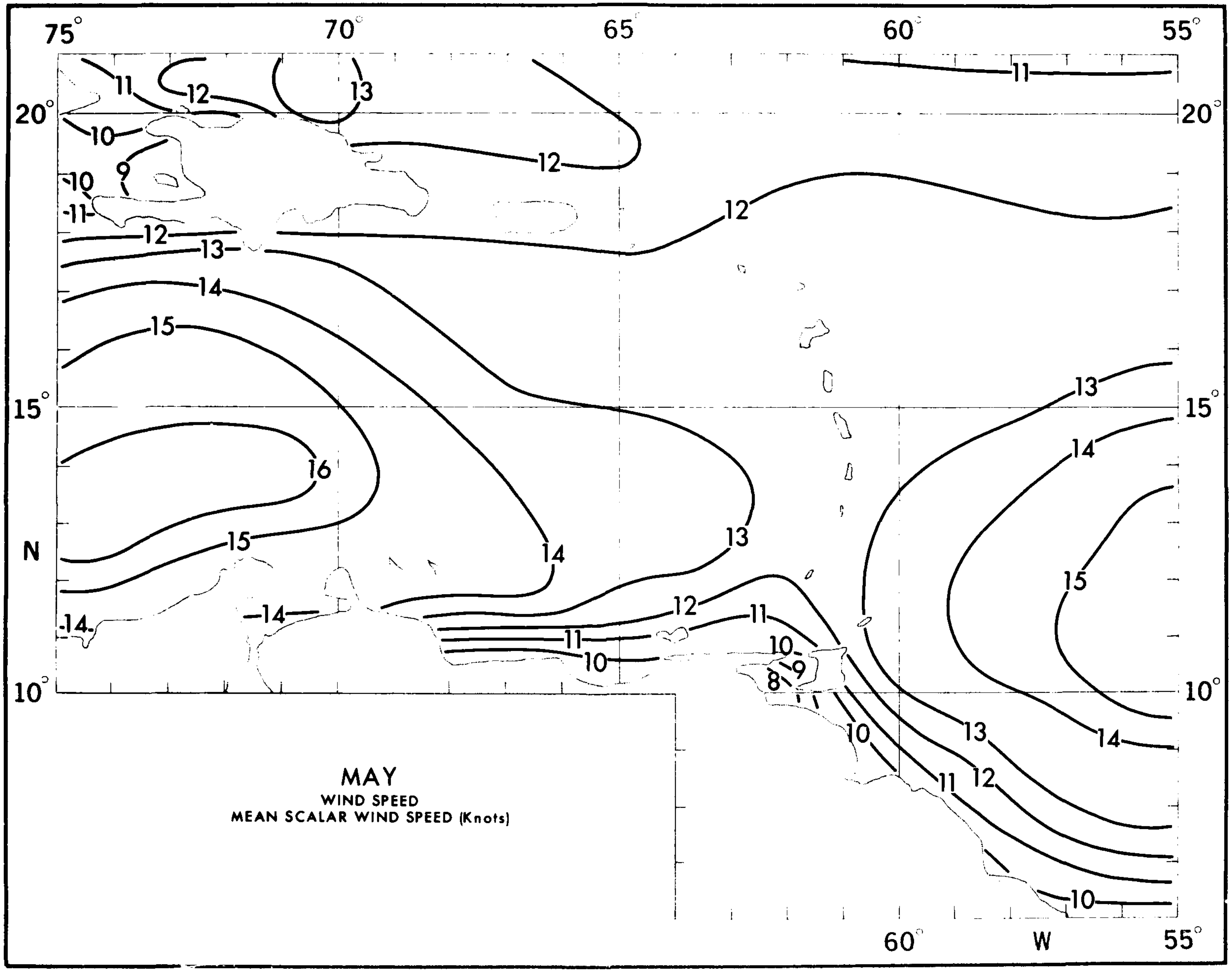

75°
70°
65°
60°
55°
20°
15°
10°
N
W
30
40
20
5
10
MAY
CEILING-VISIBILITY (MID RANGE)
PERCENT FREQUENCY OF:
SOLID LINE - CEILING <1000 FEET AND/OR
VISIBILITY <5 N. MILES
DASHED LINE - CEILING <8000 FEET AND/OR
VISIBILITY <10 N. MILES



MAY
CEILING-VISIBILITY (LOW RANGE)
PERCENT FREQUENCY OF:
SOLID LINE - CEILING <300 FEET AND/OR VISIBILITY <1 N. MILE
DASHED LINE - CEILING <600 FEET AND/OR VISIBILITY <2 N. MILES
<1
<2
75°
70°
65°
60°
55°
W
20°
15°
10°
N



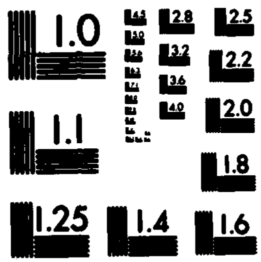
75° 70° 65° 60° 55°
20° 15° 10°
N
W
MAY
WIND-VISIBILITY-CLOUDINESS
SOLID LINE - PERCENT FREQUENCY OF OPTIMUM CONDITIONS: LCC ≥5000 FT., (OR NO LCC), VSBY. ≥5 N. MI. AND WIND 11-21 KTS.
DASHED LINE - PERCENT FREQUENCY OF POOR CONDITIONS. ANY ONE OF THE FOLLOWING CONSTITUTES POOR CONDITIONS: LCC <300 FT., VSBY. <1 N. MI., WIND <6 OR ≥34 KTS.



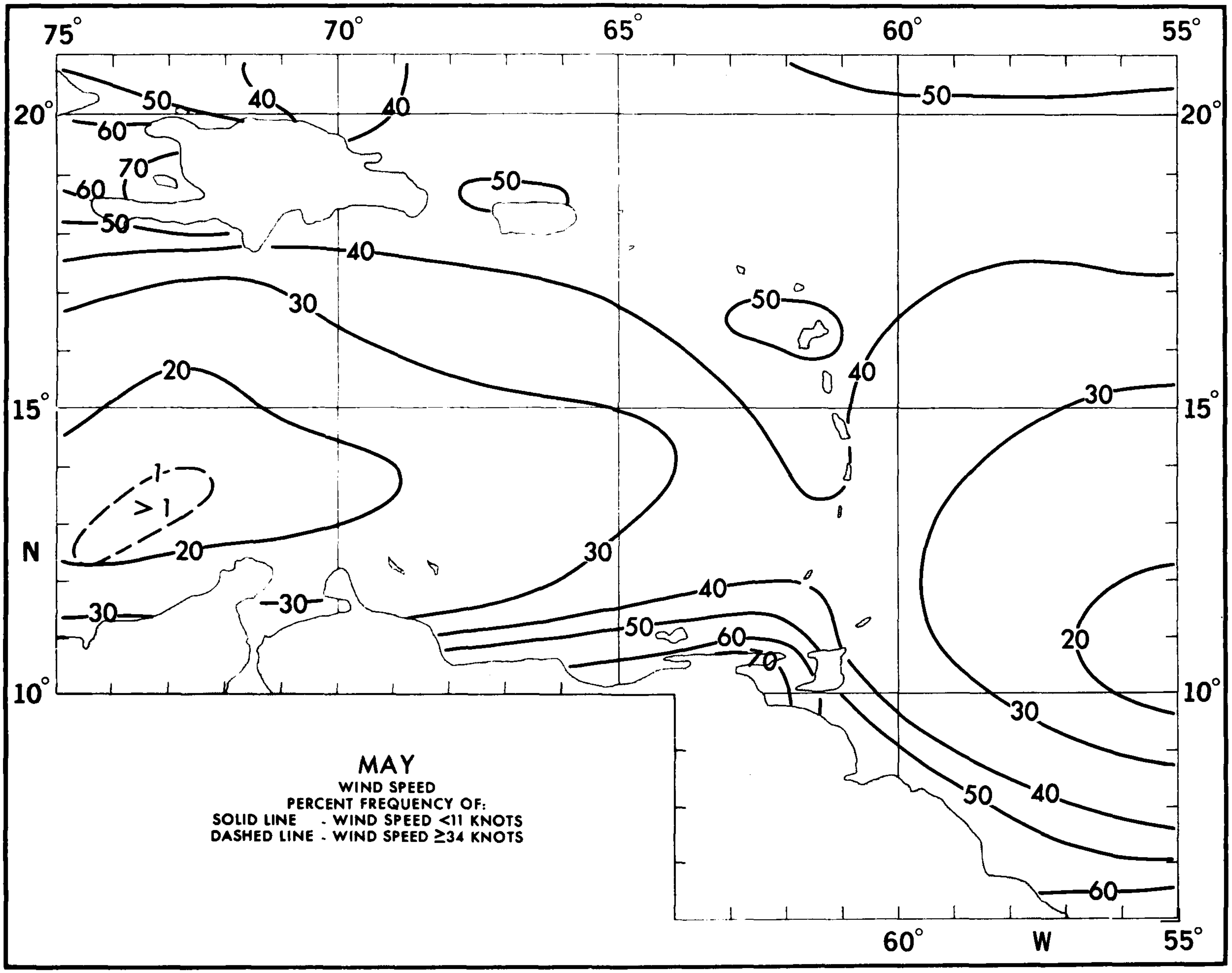
75°
70°
65°
60°
55°
20°
15°
10°
N
W
11
12
13
10
9
14
15
16
8
MAY
WIND SPEED
MEAN SCALAR WIND SPEED (Knots)

AD-A171 487 US NAVY CLIMATIC STUDY OF THE CARIBBEAN SEA AND GULF OF MEXICO VOLUME 2 EAST CARIBBEAN SEA(U) NAVAL AIR SYSTEMS COMMAND WASHINGTON DC MAR 86 NAVAIR-50-1C-544 2/3

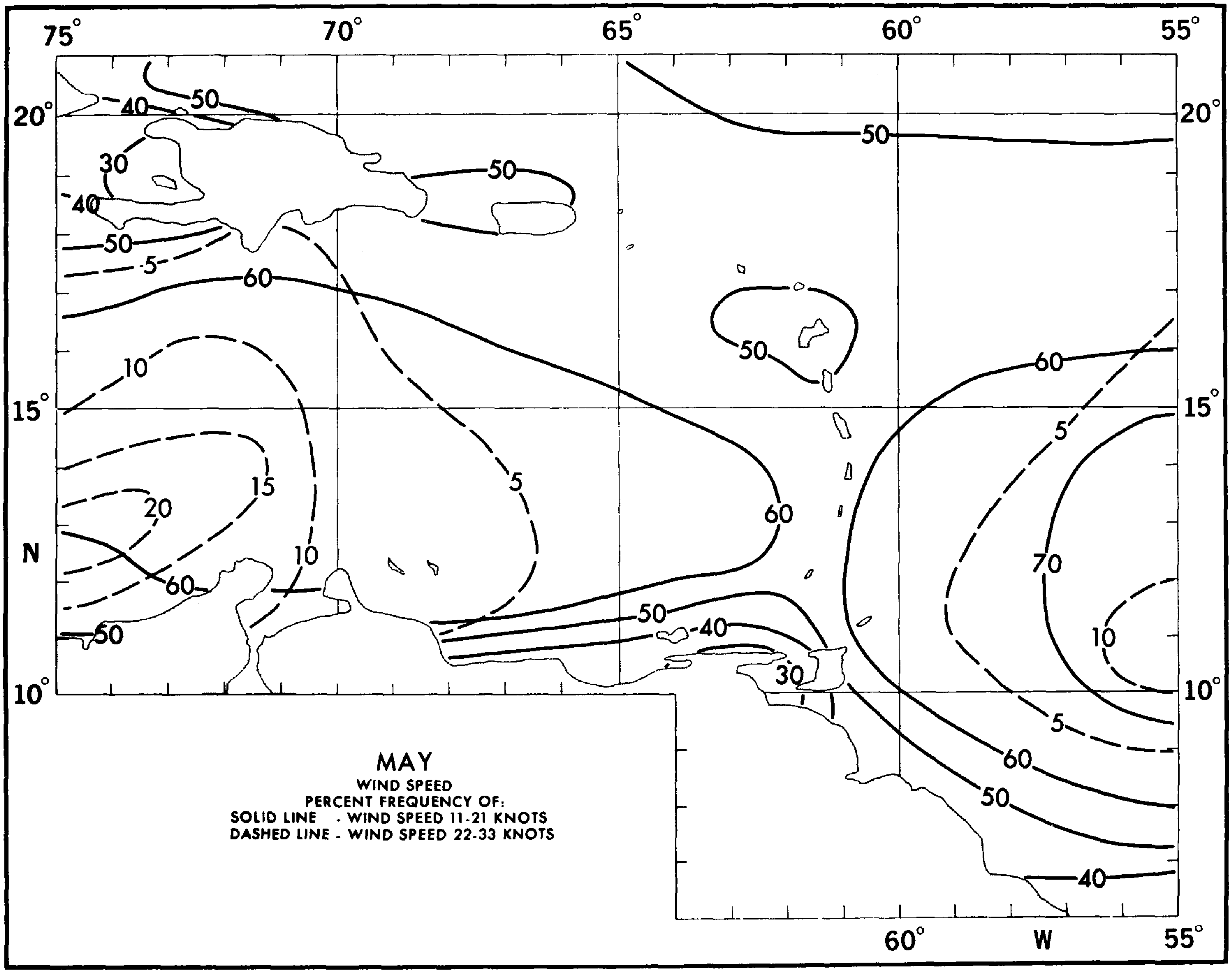
UNCLASSIFIED F/G 4/2 NL

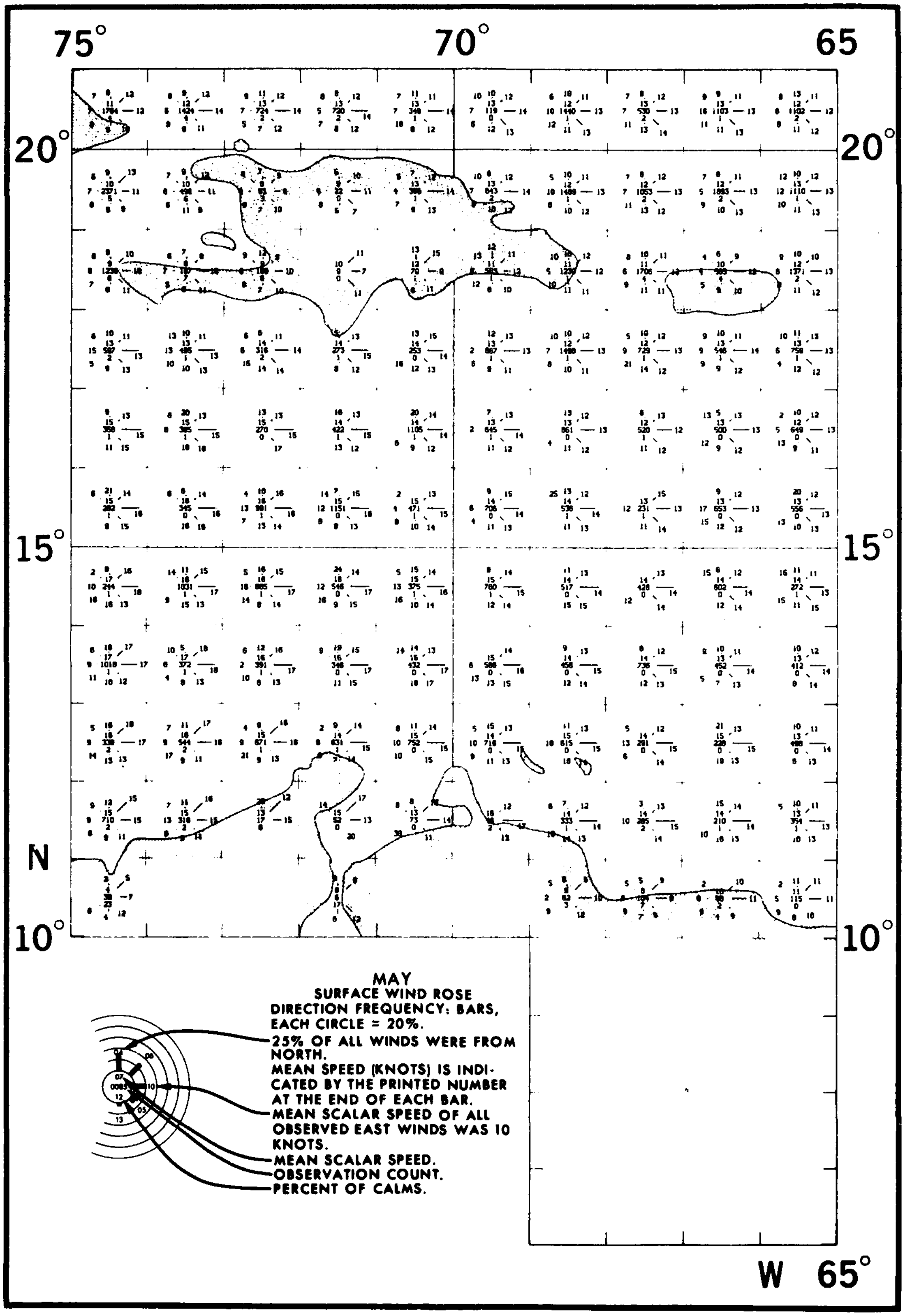


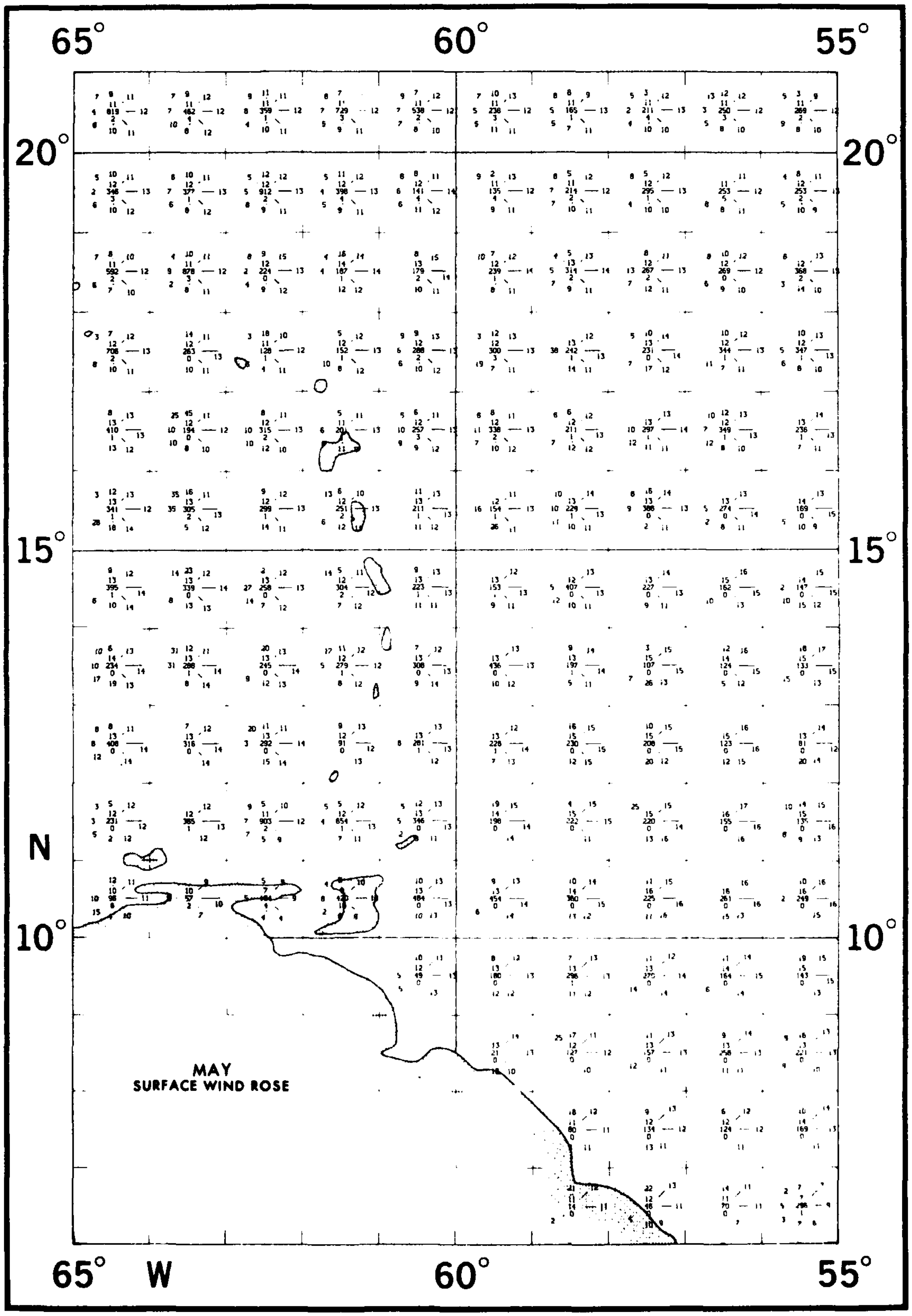
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

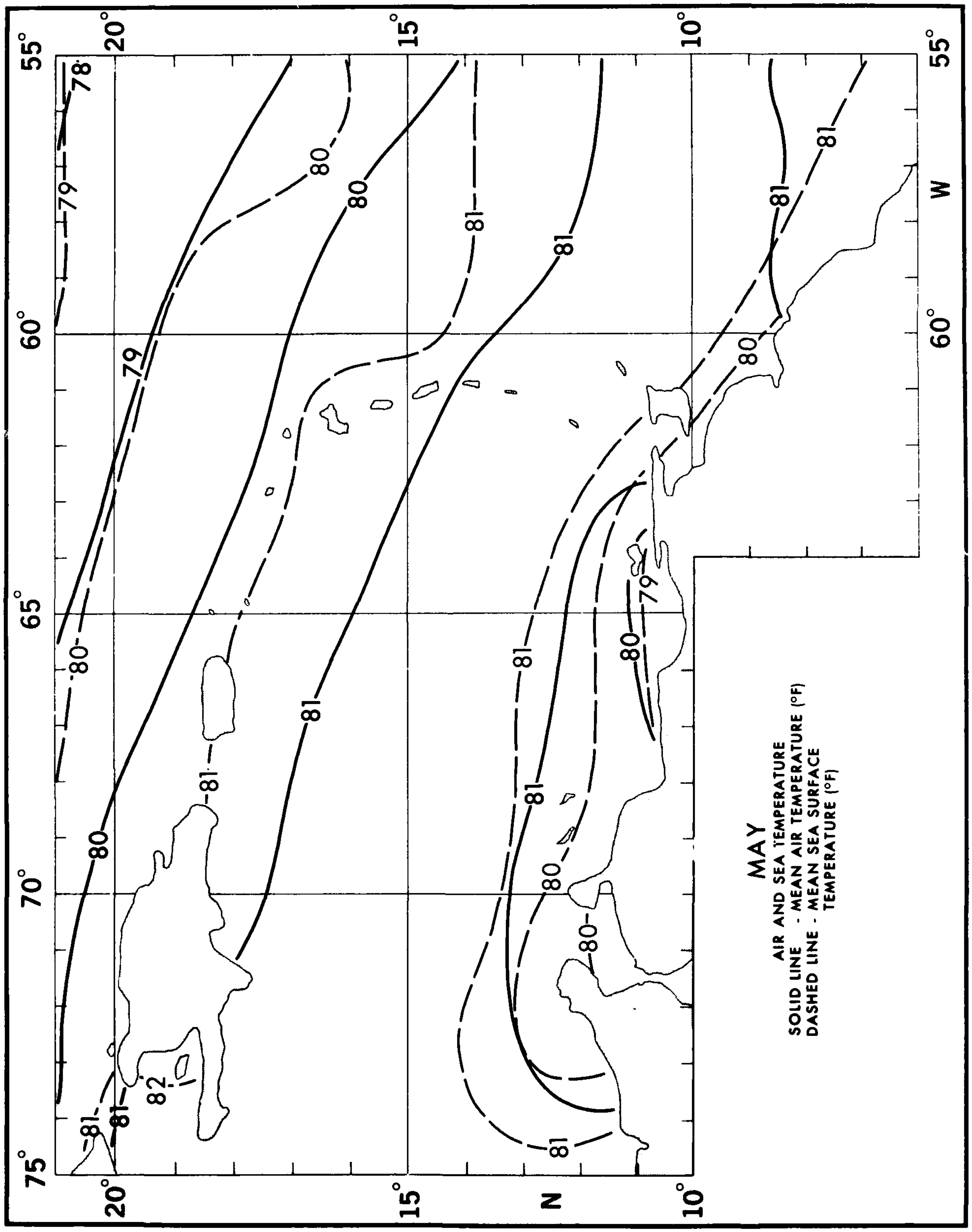


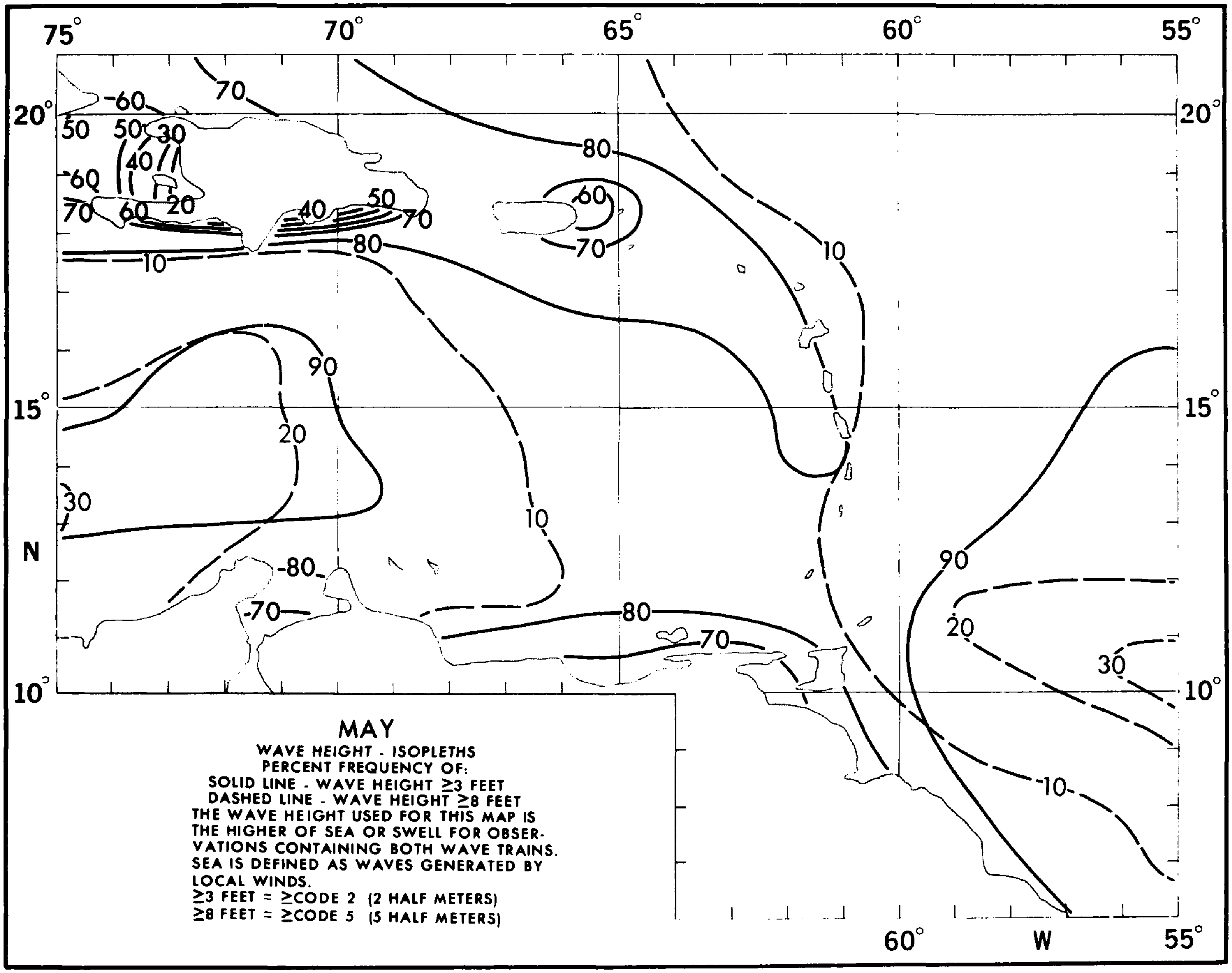
MAY
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE - WIND SPEED <11 KNOTS
DASHED LINE - WIND SPEED ≥34 KNOTS

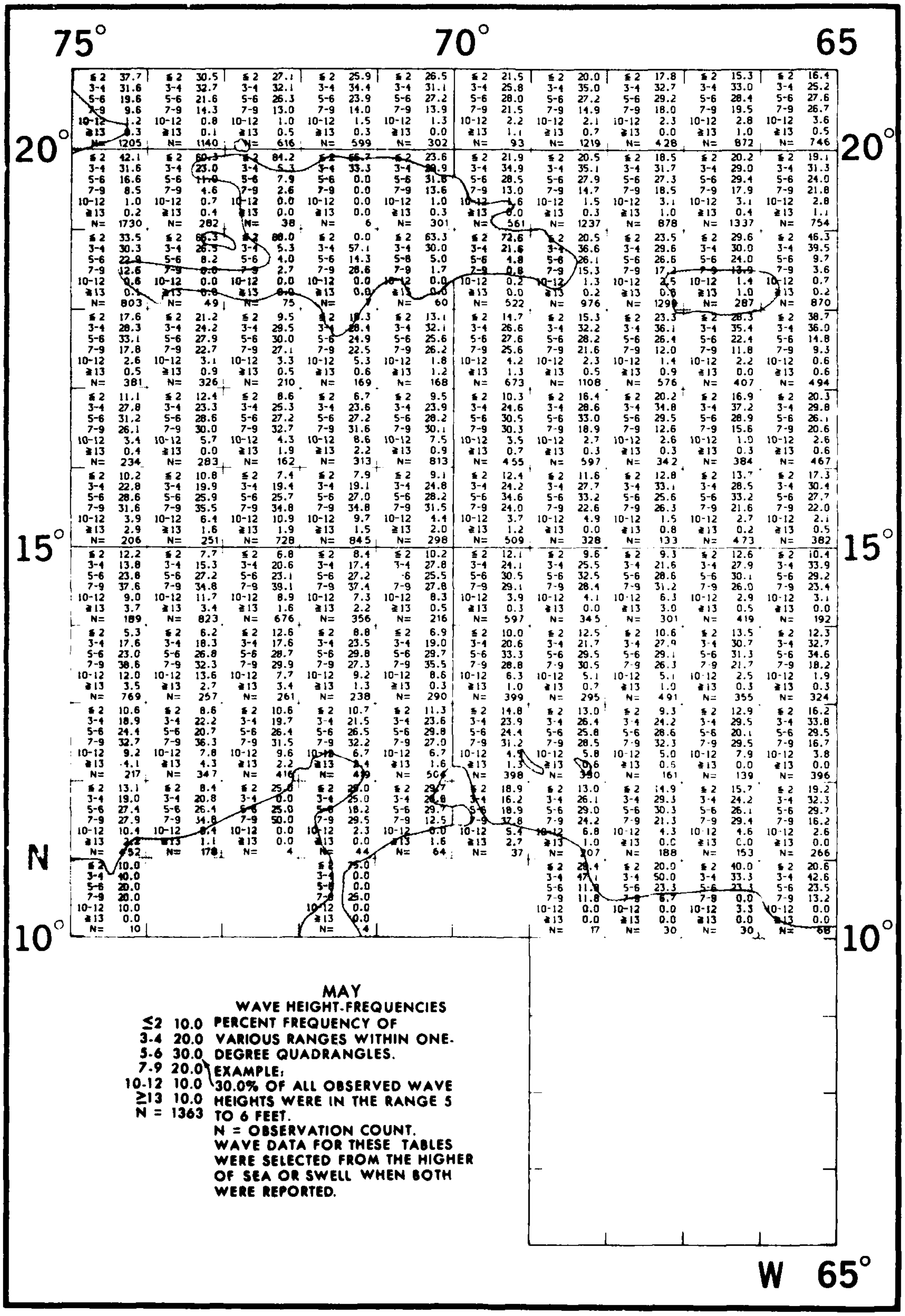

75°
70°
65°
60°
55°
20°
15°
10°
N
W
MAY
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE - WIND SPEED 11-21 KNOTS
DASHED LINE - WIND SPEED 22-33 KNOTS


75°
70°
65
20°
20°
15°
15°
N
10°
10°
W 65°
MAY
SURFACE WIND ROSE
DIRECTION FREQUENCY: BARS, EACH CIRCLE = 20%.
25% OF ALL WINDS WERE FROM NORTH.
MEAN SPEED (KNOTS) IS INDICATED BY THE PRINTED NUMBER AT THE END OF EACH BAR.
MEAN SCALAR SPEED OF ALL OBSERVED EAST WINDS WAS 10 KNOTS.
MEAN SCALAR SPEED.
OBSERVATION COUNT.
PERCENT OF CALMS.


65°
60°
55°
20°
15°
10°
N
W
MAY
SURFACE WIND ROSE


MAY
AIR AND SEA TEMPERATURE
SOLID LINE - MEAN AIR TEMPERATURE (°F)
DASHED LINE - MEAN SEA SURFACE
TEMPERATURE (°F)
75°
70°
65°
60°
55°
20°
15°
10°
N
W
78
79
80
81
82


75°
70°
65°
60°
55°
20°
15°
10°
N
W
MAY
WAVE HEIGHT - ISOPLETHS
PERCENT FREQUENCY OF:
SOLID LINE - WAVE HEIGHT ≥3 FEET
DASHED LINE - WAVE HEIGHT ≥8 FEET
THE WAVE HEIGHT USED FOR THIS MAP IS
THE HIGHER OF SEA OR SWELL FOR OBSERVATIONS CONTAINING BOTH WAVE TRAINS.
SEA IS DEFINED AS WAVES GENERATED BY
LOCAL WINDS.
≥3 FEET = ≥CODE 2 (2 HALF METERS)
≥8 FEET = ≥CODE 5 (5 HALF METERS)



MAY

WAVE HEIGHT-FREQUENCIES

≤2	10.0	PERCENT FREQUENCY OF
3-4	20.0	VARIOUS RANGES WITHIN ONE-
5-6	30.0	DEGREE QUADRANGLES.
7-9	20.0	EXAMPLE:
10-12	10.0	30.0% OF ALL OBSERVED WAVE
≥13	10.0	HEIGHTS WERE IN THE RANGE 5
N =	1363	TO 6 FEET.

N = OBSERVATION COUNT.
WAVE DATA FOR THESE TABLES WERE SELECTED FROM THE HIGHER OF SEA OR SWELL WHEN BOTH WERE REPORTED.

65° 60° 55°

≤2	15.0	≤2	17.2	≤2	15.2	≤2	20.7	≤2	17.0	≤2	20.0	≤2	21.2	≤2	17.7	≤2	16.7	≤2	16.9
3-4	26.2	3-4	25.5	3-4	29.2	3-4	20.7	3-4	29.5	3-4	22.7	3-4	25.4	3-4	19.0	3-4	22.0	3-4	22.1
5-6	32.2	5-6	28.5	5-6	26.3	5-6	29.3	5-6	23.0	5-6	22.7	5-6	25.4	5-6	35.4	5-6	33.0	5-6	32.9
7-9	23.0	7-9	24.3	7-9	24.3	7-9	23.9	7-9	24.7	7-9	29.2	7-9	21.2	7-9	24.1	7-9	23.9	7-9	25.8
10-12	2.8	10-12	3.3	10-12	4.1	10-12	3.7	10-12	3.4	10-12	4.9	10-12	5.1	10-12	3.2	10-12	3.8	10-12	2.3
≥13	0.8	≥13	1.2	≥13	0.8	≥13	1.7	≥13	2.3	≥13	0.5	≥13	1.7	≥13	0.6	≥13	0.5	≥13	0.0
N=	614	N=	337	N=	243	N=	464	N=	352	N=	185	N=	118	N=	158	N=	209	N=	213

20° 20°

≤2	15.5	≤2	14.4	≤2	15.0	≤2	21.1	≤2	16.8	≤2	19.2	≤2	15.3	≤2	14.5	≤2	20.3	≤2	16.7
3-4	31.4	3-4	27.2	3-4	24.0	3-4	24.8	3-4	23.4	3-4	21.2	3-4	25.2	3-4	22.7	3-4	22.3	3-4	24.2
5-6	26.4	5-6	26.4	5-6	29.2	5-6	27.8	5-6	29.9	5-6	29.3	5-6	27.0	5-6	30.2	5-6	30.7	5-6	27.8
7-9	22.9	7-9	27.6	7-9	26.7	7-9	22.9	7-9	23.4	7-9	28.3	7-9	27.0	7-9	29.8	7-9	22.8	7-9	25.3
10-12	3.1	10-12	2.8	10-12	4.0	10-12	2.3	10-12	6.5	10-12	2.0	10-12	4.9	10-12	2.9	10-12	2.5	10-12	5.1
≥13	0.8	≥13	1.6	≥13	1.2	≥13	1.1	≥13	0.0	≥13	0.0	≥13	0.6	≥13	0.0	≥13	1.5	≥13	1.0
N=	258	N=	250	N=	600	N=	266	N=	107	N=	99	N=	163	N=	242	N=	202	N=	198

≤2	28.4	≤2	17.2	≤2	13.6	≤2	8.4	≤2	7.6	≤2	9.3	≤2	10.4	≤2	16.2	≤2	15.5	≤2	13.9
3-4	35.1	3-4	24.8	3-4	38.5	3-4	28.2	3-4	29.0	3-4	22.4	3-4	21.9	3-4	28.8	3-4	21.8	3-4	24.7
5-6	19.4	5-6	30.5	5-6	26.6	5-6	28.2	5-6	29.7	5-6	35.5	5-6	33.1	5-6	20.7	5-6	29.6	5-6	26.0
7-9	14.9	7-9	24.1	7-9	18.9	7-9	29.0	7-9	27.6	7-9	29.0	7-9	28.6	7-9	30.2	7-9	29.6	7-9	30.3
10-12	1.9	10-12	2.1	10-12	1.8	10-12	6.1	10-12	5.5	10-12	3.8	10-12	5.6	10-12	4.1	10-12	3.4	10-12	4.3
≥13	0.4	≥13	1.2	≥13	0.6	≥13	0.0	≥13	0.7	≥13	0.0	≥13	0.4	≥13	0.0	≥13	0.0	≥13	0.9
N=	268	N=	564	N=	169	N=	131	N=	145	N=	183	N=	269	N=	222	N=	206	N=	231

≤2	22.1	≤2	14.9	≤2	25.8	≤2	12.4	≤2	10.4	≤2	12.1	≤2	12.6	≤2	14.5	≤2	11.5	≤2	17.5
3-4	27.8	3-4	45.3	3-4	38.7	3-4	38.1	3-4	30.3	3-4	29.2	3-4	24.7	3-4	25.7	3-4	29.5	3-4	23.0
5-6	28.4	5-6	26.5	5-6	21.0	5-6	22.9	5-6	24.0	5-6	27.3	5-6	28.9	5-6	33.0	5-6	28.0	5-6	31.1
7-9	20.0	7-9	12.7	7-9	12.9	7-9	23.8	7-9	30.8	7-9	27.3	7-9	28.4	7-9	19.0	7-9	27.5	7-9	22.4
10-12	1.5	10-12	0.6	10-12	1.6	10-12	2.9	10-12	4.1	10-12	3.0	10-12	4.2	10-12	7.3	10-12	3.0	10-12	5.5
≥13	0.2	≥13	0.0	≥13	0.0	≥13	0.0	≥13	0.5	≥13	1.1	≥13	1.1	≥13	0.6	≥13	0.5	≥13	0.5
N=	475	N=	181	N=	62	N=	105	N=	221	N=	264	N=	190	N=	179	N=	200	N=	183

≤2	17.7	≤2	23.7	≤2	21.7	≤2	17.4	≤2	14.2	≤2	14.7	≤2	14.6	≤2	12.7	≤2	12.5	≤2	16.7
3-4	31.6	3-4	31.9	3-4	29.7	3-4	31.3	3-4	24.4	3-4	31.5	3-4	29.1	3-4	22.1	3-4	25.0	3-4	21.4
5-6	32.0	5-6	20.7	5-6	27.8	5-6	19.1	5-6	27.3	5-6	23.4	5-6	24.5	5-6	28.7	5-6	30.1	5-6	28.6
7-9	17.3	7-9	20.7	7-9	19.3	7-9	27.8	7-9	28.4	7-9	24.9	7-9	28.5	7-9	30.4	7-9	26.1	7-9	27.8
10-12	1.5	10-12	2.2	10-12	0.9	10-12	4.3	10-12	4.5	10-12	5.1	10-12	3.3	10-12	4.4	10-12	5.7	10-12	4.0
≥13	0.0	≥13	0.7	≥13	0.5	≥13	0.0	≥13	1.1	≥13	0.4	≥13	0.0	≥13	1.7	≥13	0.6	≥13	1.6
N=	266	N=	135	N=	212	N=	115	N=	176	N=	273	N=	151	N=	181	N=	176	N=	126

≤2	19.5	≤2	18.1	≤2	20.0	≤2	25.6	≤2	14.4	≤2	19.6	≤2	17.8	≤2	11.4	≤2	7.8	≤2	9.4
3-4	34.4	3-4	34.2	3-4	29.6	3-4	29.8	3-4	24.7	3-4	28.4	3-4	26.1	3-4	21.1	3-4	16.2	3-4	29.1
5-6	26.0	5-6	28.8	5-6	30.0	5-6	28.0	5-6	30.8	5-6	23.5	5-6	27.4	5-6	30.8	5-6	44.1	5-6	30.8
7-9	18.3	7-9	18.5	7-9	19.6	7-9	14.3	7-9	26.7	7-9	26.5	7-9	25.5	7-9	32.4	7-9	26.3	7-9	25.6
10-12	1.1	10-12	0.4	10-12	0.4	10-12	1.8	10-12	2.7	10-12	2.0	10-12	3.2	10-12	3.8	10-12	4.5	10-12	4.3
≥13	0.8	≥13	0.0	≥13	0.4	≥13	0.6	≥13	0.7	≥13	0.0	≥13	0.0	≥13	0.5	≥13	1.1	≥13	0.9
N=	262	N=	243	N=	230	N=	168	N=	146	N=	102	N=	157	N=	185	N=	179	N=	117

15° 15°

≤2	12.5	≤2	16.5	≤2	14.0	≤2	24.5	≤2	16.6	≤2	15.9	≤2	14.2	≤2	10.4	≤2	5.7	≤2	8.8
3-4	31.0	3-4	28.4	3-4	38.0	3-4	36.5	3-4	29.0	3-4	27.3	3-4	27.3	3-4	23.2	3-4	24.6	3-4	28.3
5-6	37.0	5-6	31.2	5-6	27.4	5-6	25.5	5-6	29.7	5-6	25.0	5-6	23.9	5-6	30.4	5-6	36.9	5-6	27.4
7-9	16.2	7-9	18.8	7-9	16.2	7-9	12.5	7-9	19.3	7-9	27.3	7-9	29.5	7-9	27.2	7-9	26.2	7-9	27.4
10-12	3.4	10-12	3.2	10-12	3.4	10-12	0.5	10-12	4.8	10-12	3.4	10-12	4.5	10-12	8.8	10-12	5.7	10-12	5.3
≥13	0.0	≥13	1.8	≥13	1.1	≥13	0.5	≥13	0.7	≥13	1.1	≥13	0.6	≥13	0.0	≥13	0.8	≥13	2.7
N=	297	N=	218	N=	179	N=	192	N=	145	N=	88	N=	176	N=	125	N=	122	N=	113

≤2	10.1	≤2	16.3	≤2	10.6	≤2	13.3	≤2	9.6	≤2	16.4	≤2	13.9	≤2	1.4	≤2	13.5	≤2	11.2
3-4	33.1	3-4	32.1	3-4	36.7	3-4	29.8	3-4	31.5	3-4	32.2	3-4	19.8	3-4	31.1	3-4	24.0	3-4	20.6
5-6	29.6	5-6	32.1	5-6	27.1	5-6	32.0	5-6	24.9	5-6	22.0	5-6	30.7	5-6	37.8	5-6	27.9	5-6	28.0
7-9	23.7	7-9	18.1	7-9	21.3	7-9	18.2	7-9	26.4	7-9	22.6	7-9	26.7	7-9	20.3	7-9	29.8	7-9	31.8
10-12	2.4	10-12	1.4	10-12	3.2	10-12	5.0	10-12	7.1	10-12	5.6	10-12	7.9	10-12	6.8	10-12	3.8	10-12	7.5
≥13	1.2	≥13	0.0	≥13	1.1	≥13	1.7	≥13	0.5	≥13	1.1	≥13	1.0	≥13	2.7	≥13	1.0	≥13	0.9
N=	169	N=	221	N=	188	N=	181	N=	197	N=	177	N=	101	N=	74	N=	104	N=	107

≤2	14.4	≤2	14.5	≤2	14.8	≤2	8.5	≤2	12.0	≤2	9.8	≤2	6.2	≤2	6.5	≤2	12.0	≤2	20.3
3-4	33.0	3-4	36.4	3-4	36.8	3-4	49.2	3-4	22.9	3-4	23.0	3-4	29.5	3-4	20.9	3-4	22.8	3-4	25.0
5-6	29.9	5-6	30.5	5-6	27.8	5-6	20.3	5-6	30.3	5-6	31.1	5-6	28.1	5-6	32.7	5-6	31.5	5-6	20.3
7-9	18.2	7-9	16.4	7-9	19.3	7-9	16.9	7-9	29.7	7-9	29.5	7-9	26.7	7-9	30.7	7-9	28.3	7-9	29.7
10-12	4.1	10-12	2.3	10-12	1.3	10-12	1.7	10-12	2.9	10-12	4.9	10-12	7.5	10-12	6.5	10-12	5.4	10-12	3.1
≥13	0.3	≥13	0.0	≥13	0.0	≥13	3.4	≥13	2.3	≥13	1.6	≥13	2.1	≥13	2.6	≥13	0.0	≥13	1.6
N=	291	N=	220	N=	223	N=	59	N=	175	N=	122	N=	146	N=	153	N=	92	N=	64

N

≤2	27.3	≤2	16.9	≤2	22.0	≤2	16.8	≤2	8.3	≤2	9.1	≤2	8.0	≤2	7.9	≤2	7.9	≤2	5.4
3-4	20.9	3-4	33.3	3-4	29.0	3-4	34.4	3-4	29.4	3-4	22.7	3-4	23.3	3-4	25.7	3-4	13.2	3-4	22.6
5-6	30.9	5-6	25.7	5-6	30.9	5-6	29.4	5-6	28.0	5-6	27.3	5-6	26.7	5-6	28.3	5-6	27.2	5-6	30.1
7-9	19.4	7-9	19.7	7-9	15.8	7-9	17.2	7-9	28.0	7-9	29.5	7-9	34.0	7-9	27.0	7-9	36.8	7-9	34.4
10-12	1.4	10-12	4.0	10-12	2.3	10-12	1.7	10-12	5.0	10-12	9.1	10-12	4.7	10-12	9.2	10-12	10.5	10-12	6.5
≥13	0.0	≥13	0.4	≥13	0.0	≥13	0.4	≥13	1.4	≥13	2.3	≥13	3.3	≥13	2.0	≥13	4.4	≥13	1.1
N=	139	N=	249	N=	431	N=	459	N=	218	N=	132	N=	150	N=	152	N=	114	N=	93

≤2	28.8	≤2	43.8	≤2	37.5	≤2	23.7	≤2	10.7	≤2	12.8	≤2	9.8	≤2	3.9	≤2	1.7	≤2	4.0
3-4	38.5	3-4	31.3	3-4	35.0	3-4	37.5	3-4	28.6	3-4	24.3	3-4	26.8	3-4	20.3	3-4	22.9	3-4	14.7
5-6	23.1	5-6	18.8	5-6	12.5	5-6	26.2	5-6	31.0	5-6	32.8	5-6	29.7	5-6	24.8	5-6	25.1	5-6	25.4
7-9	9.6	7-9	6.3	7-9	15.0	7-9	10.0	7-9	26.5	7-9	23.4	7-9	28.3	7-9	37.9	7-9	34.3	7-9	42.4
10-12	0.0	10-12	0.0	10-12	0.0	10-12	2.5	10-12	2.7	10-12	6.4	10-12	4.0	10-12	9.8	10-12	12.6	10-12	10.2
≥13	0.0	≥13	0.0	≥13	0.0	≥13	0.0	≥13	0.6	≥13	0.3	≥13	1.4	≥13	3.3	≥13	3.4	≥13	3.4
N=	52	N=	16	N=	40	N=	80	N=	336	N=	329	N=	276	N=	153	N=	175	N=	177

10° 10°

				≤2	0.0			≤2	6.8	≤2	9.3	≤2	12.7	≤2	10.3	≤2	7.1	≤2	2.1
				3-4	0.0			3-4	31.8	3-4	32.0	3-4	23.5	3-4	26.8	3-4	25.7	3-4	18.8
				5-6	0.0			5-6	29.5	5-6	27.8	5-6	33.3	5-6	32.5	5-6	23.0	5-6	30.2
				7-9	100.0			7-9	29.5	7-9	23.7	7-9	27.2	7-9	27.3	7-9	35.4	7-9	37.5
				10-12	0.0			10-12	2.3	10-12	7.2	10-12	2.8	10-12	3.1	10-12	8.0	10-12	8.3
				≥13	0.0			≥13	0.0	≥13	0.0	≥13	0.5	≥13	0.0	≥13	0.9	≥13	3.1
				N=	1			N=	44	N=	97	N=	213	N=	194	N=	113	N=	96

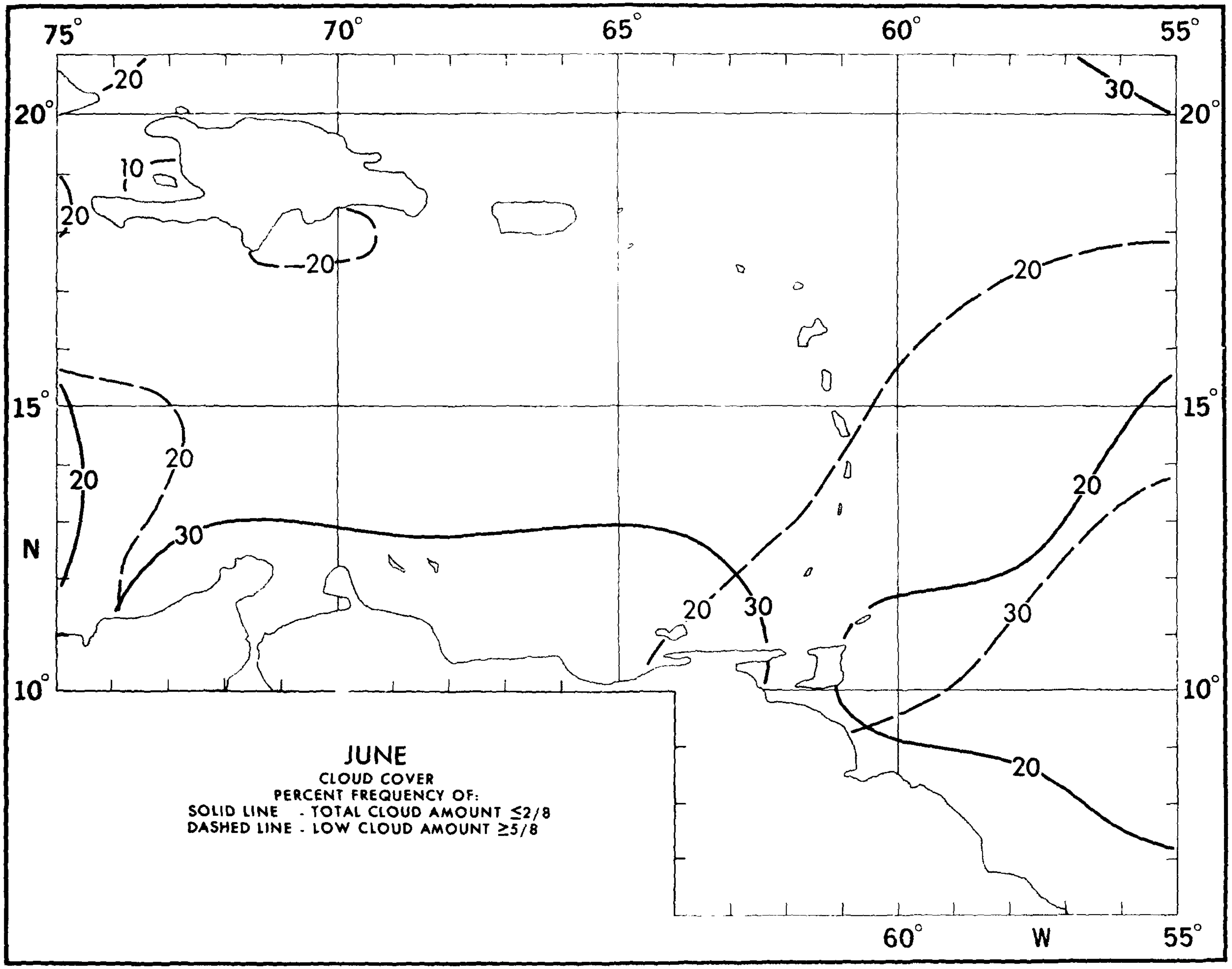
≤2	50.0	≤2	0.0	≤2	4.1	≤2	3.4	≤2	13.1	≤2	13.2
3-4	50.0	3-4	20.0	3-4	14.3	3-4	24.8	3-4	26.7	3-4	29.6
5-6	0.0	5-6	20.0	5-6	46.9	5-6	47.0	5-6	25.1	5-6	25.8
7-9	0.0	7-9	40.0	7-9	24.5	7-9	18.8	7-9	28.8	7-9	27.7
10-12	0.0	10-12	20.0	10-12	10.2	10-12	6.0	10-12	5.2	10-12	3.1
≥13	0.0	≥13	0.0	≥13	0.0	≥13	0.0	≥13	1.0	≥13	0.6
N=	2	N=	5	N=	49	N=	117	N=	191	N=	159

MAY
WAVE HEIGHT-FREQUENCIES

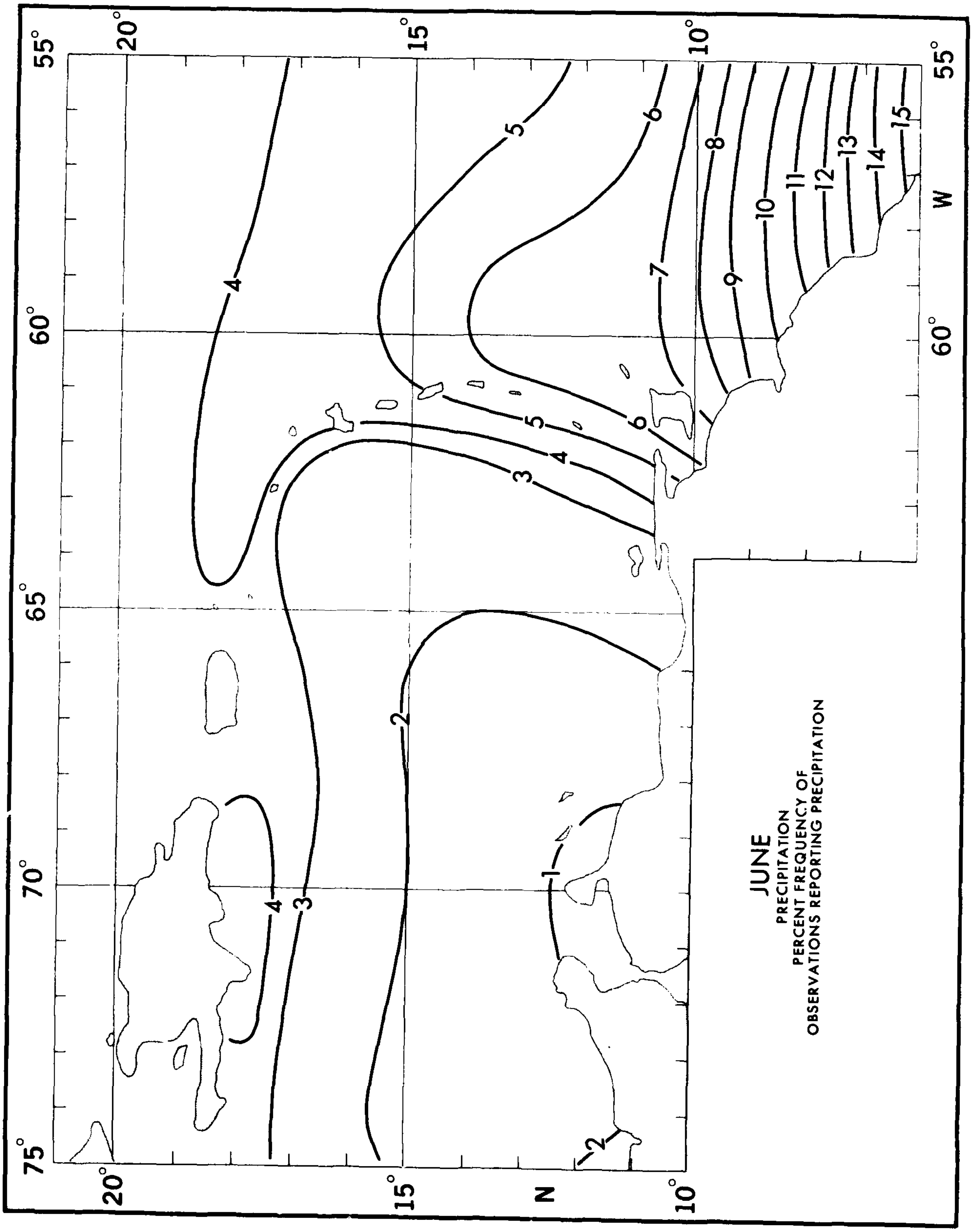
≤2	0.0	≤2	3.0	≤2	5.7	≤2	9.6
3-4	35.7	3-4	43.4	3-4	28.4	3-4	30.4
5-6	28.6	5-6	48.5	5-6	44.3	5-6	28.8
7-9	28.6	7-9	5.1	7-9	18.2	7-9	29.6
10-12	0.0	10-12	0.0	10-12	3.4	10-12	1.6
≥13	7.1	≥13	0.0	≥13	0.0	≥13	0.0
N=	14	N=	99	N=	88	N=	125

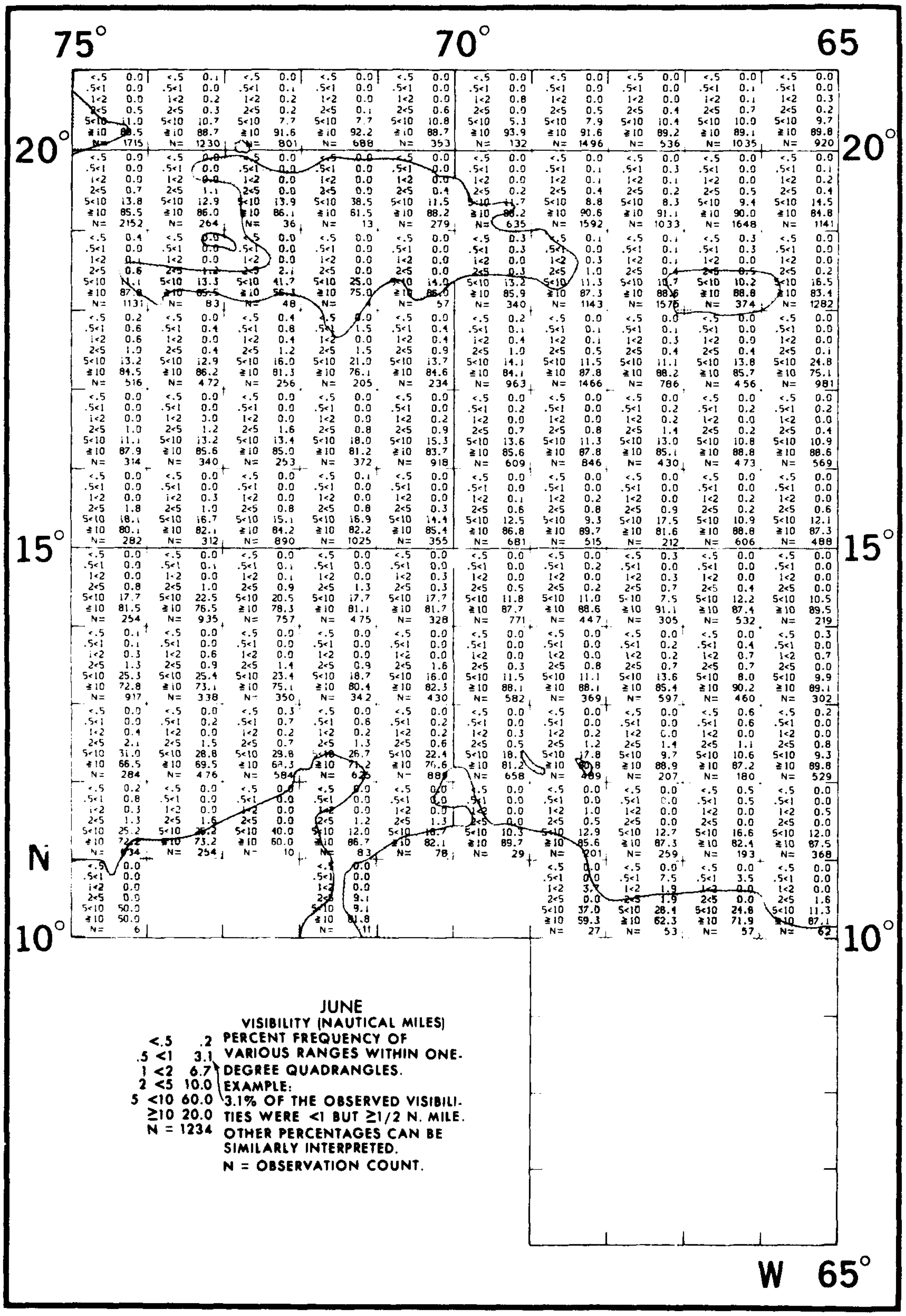
≤2	0.0	≤2	25.0	≤2	10.0	≤2	10.5
3-4	100.0	3-4	25.0	3-4	40.0	3-4	31.6
5-6	0.0	5-6	25.0	5-6	40.0	5-6	28.9
7-9	0.0	7-9	25.0	7-9	10.0	7-9	26.3
10-12	0.0	10-12	0.0	10-12	0.0	10-12	2.6
≥13	0.0	≥13	0.0	≥13	0.0	≥13	0.0
N=	1	N=		N=	10	N=	38

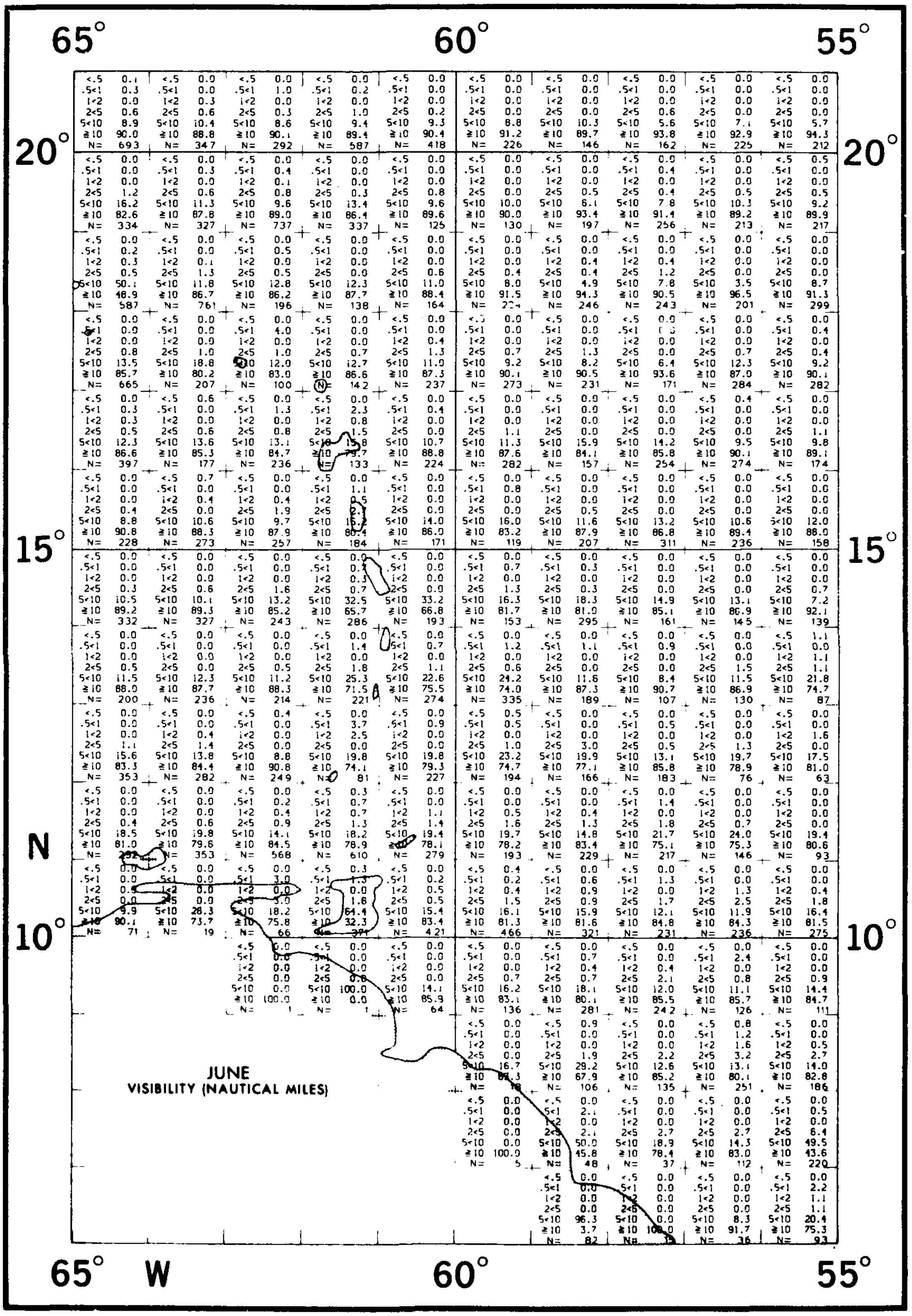
65° W 60° 55°



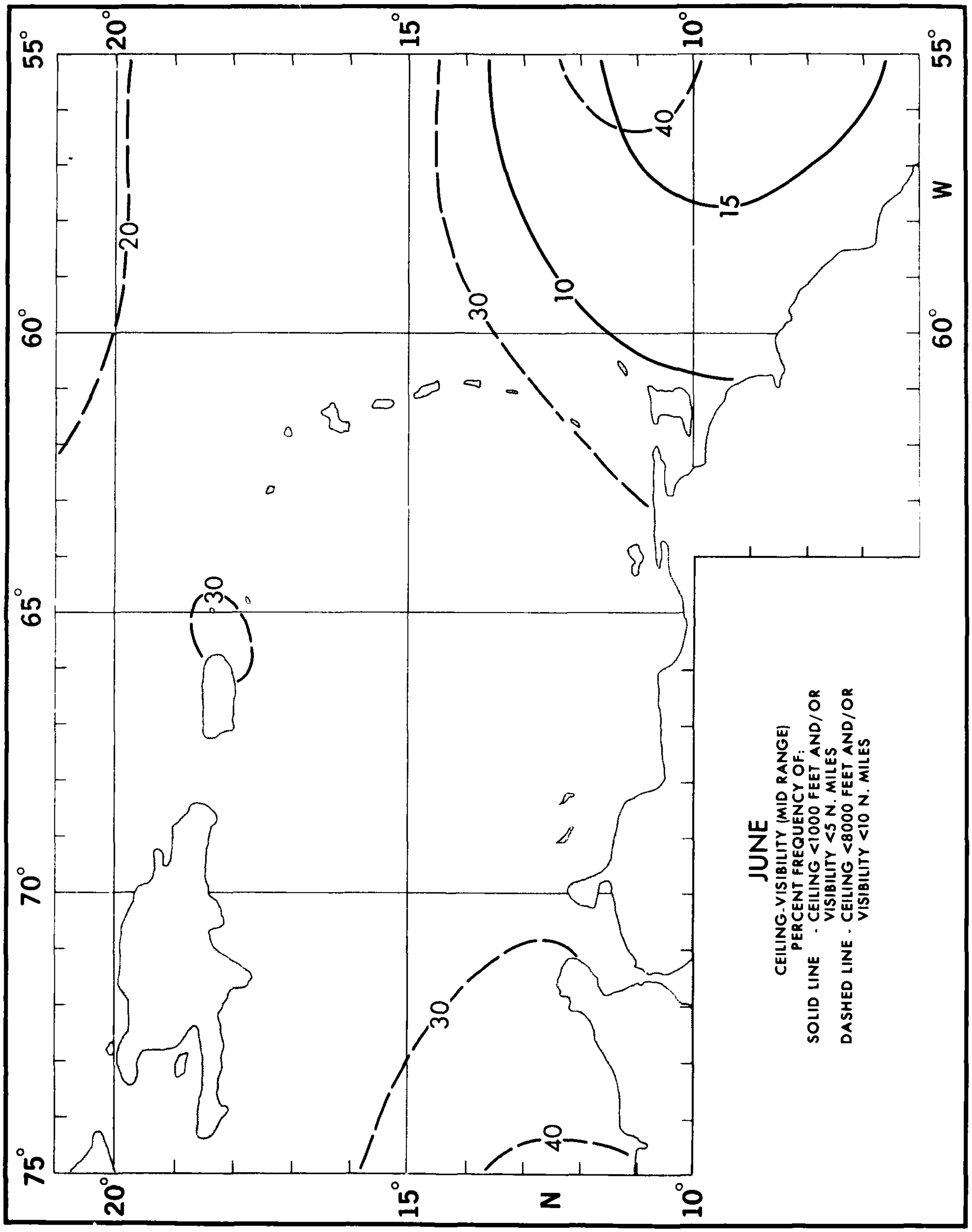
JUNE
CLOUD COVER
PERCENT FREQUENCY OF:
SOLID LINE - TOTAL CLOUD AMOUNT $\leq 2/8$
DASHED LINE - LOW CLOUD AMOUNT $\geq 5/8$

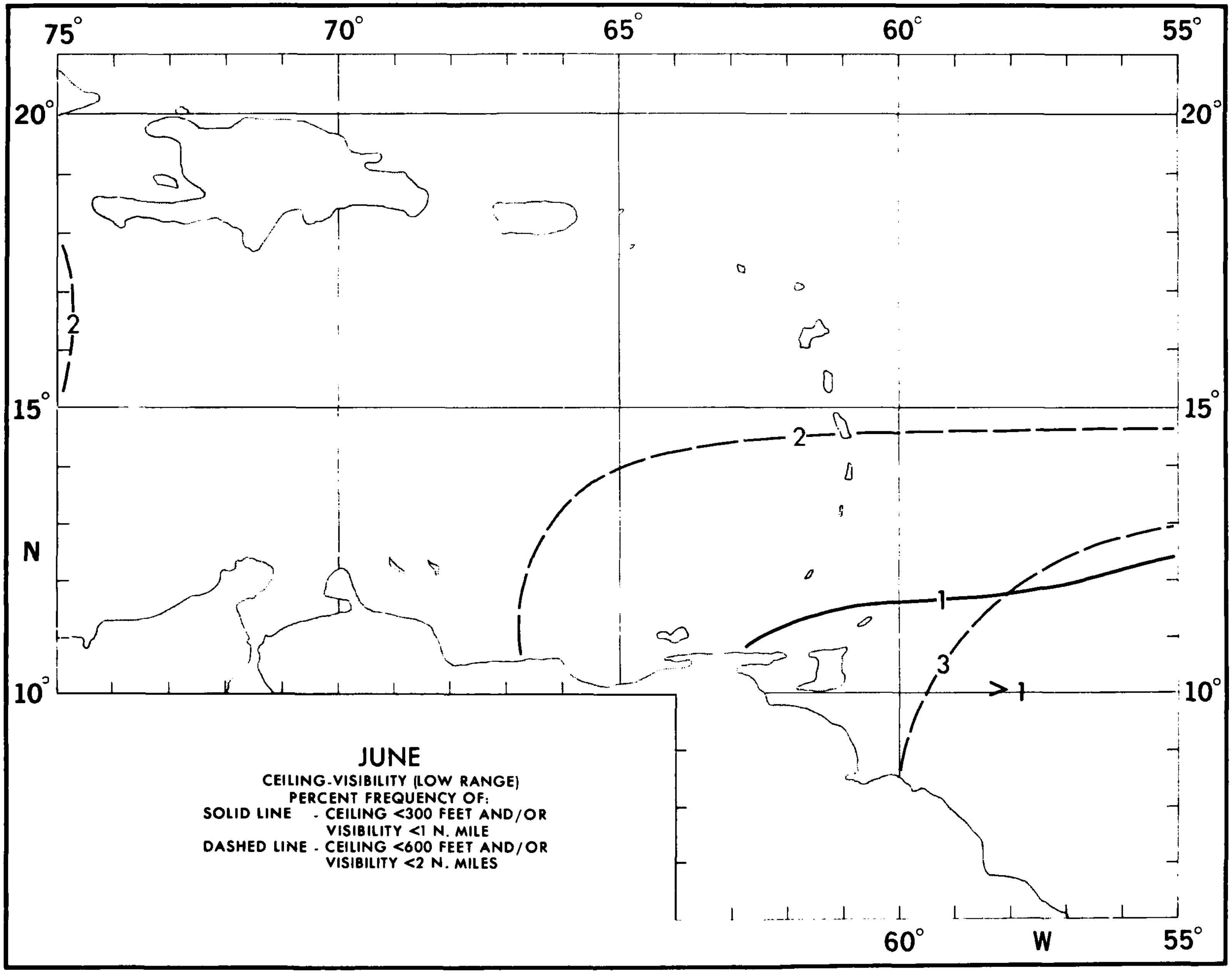

JUNE
PRECIPITATION
PERCENT FREQUENCY OF
OBSERVATIONS REPORTING PRECIPITATION
75°
70°
65°
60°
55°
20°
15°
10°
N
W
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15


75°
70°
65
20°
15°
N
10°
W 65°
JUNE
VISIBILITY (NAUTICAL MILES)
<.5 .2
.5 <1 3.1
1 <2 6.7
2 <5 10.0
5 <10 60.0
≥10 20.0
N = 1234
PERCENT FREQUENCY OF VARIOUS RANGES WITHIN ONE-DEGREE QUADRANGLES.
EXAMPLE:
3.1% OF THE OBSERVED VISIBILITIES WERE <1 BUT ≥1/2 N. MILE.
OTHER PERCENTAGES CAN BE SIMILARLY INTERPRETED.
N = OBSERVATION COUNT.

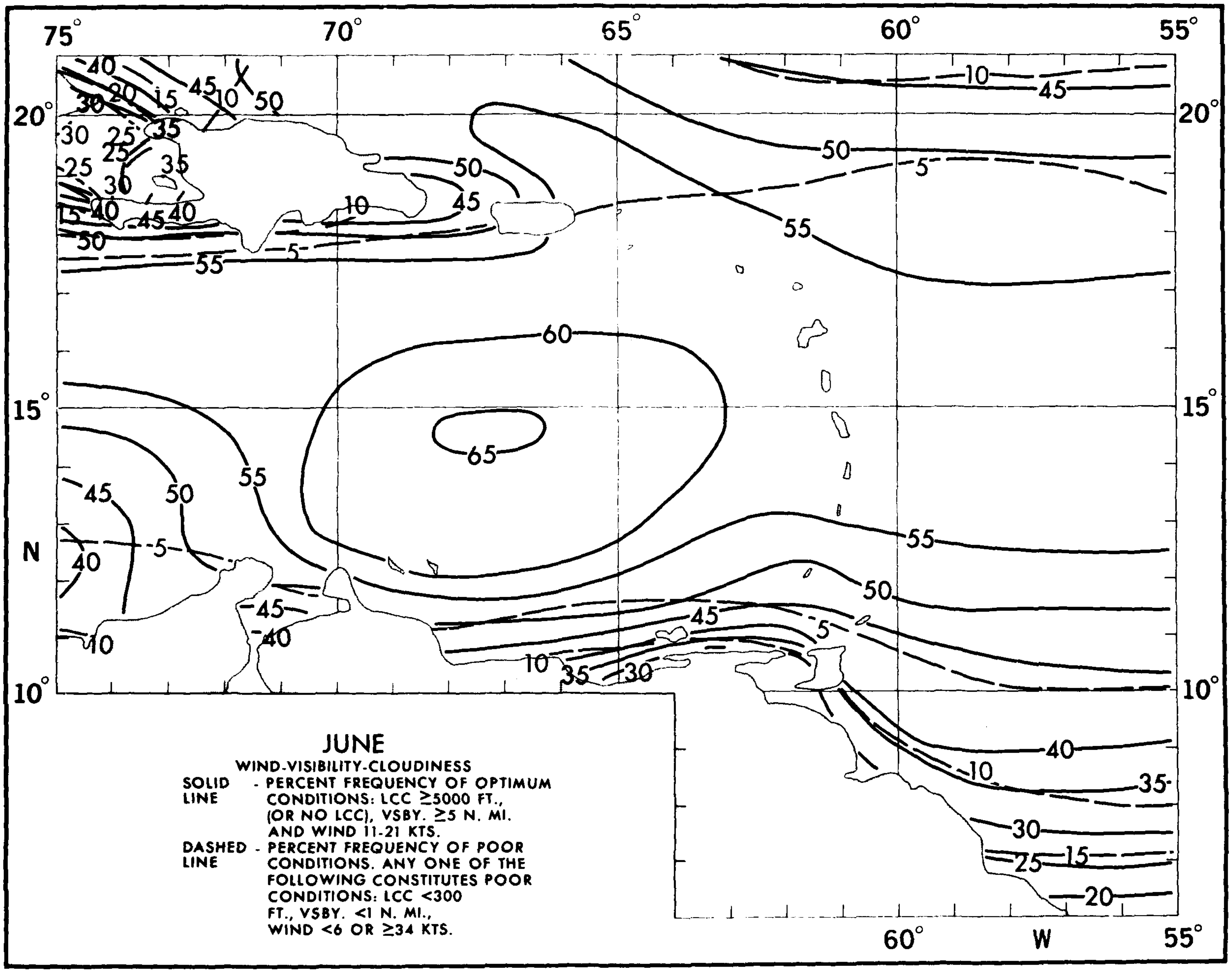


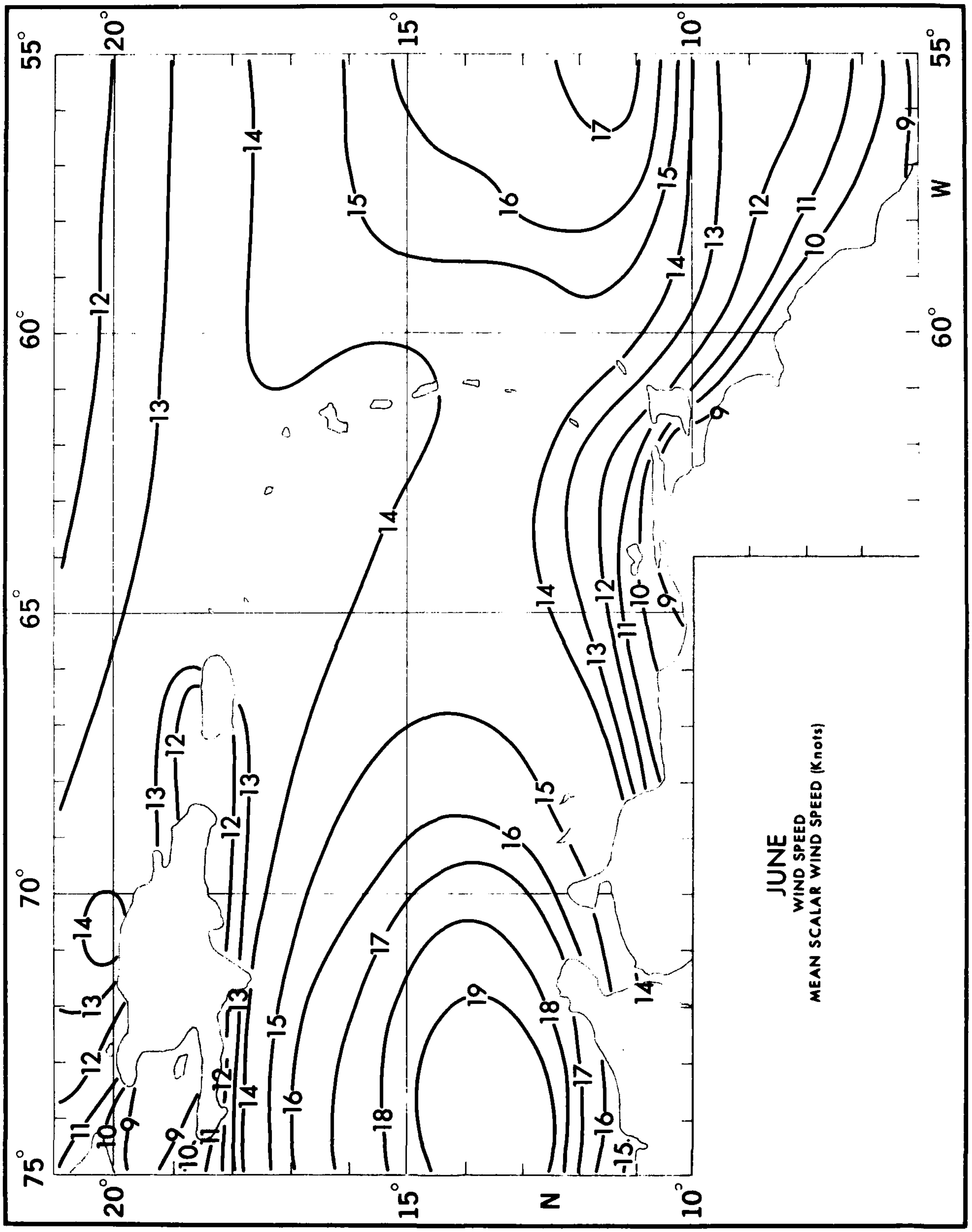
65°
60°
55°
20°
15°
N
10°
W
JUNE
VISIBILITY (NAUTICAL MILES)


JUNE
CEILING-VISIBILITY (MID RANGE)
PERCENT FREQUENCY OF:
SOLID LINE - CEILING <1000 FEET AND/OR VISIBILITY <5 N. MILES
DASHED LINE - CEILING <8000 FEET AND/OR VISIBILITY <10 N. MILES
75°
70°
65°
60°
55°
20°
15°
10°
N
W
20
30
10
15
40

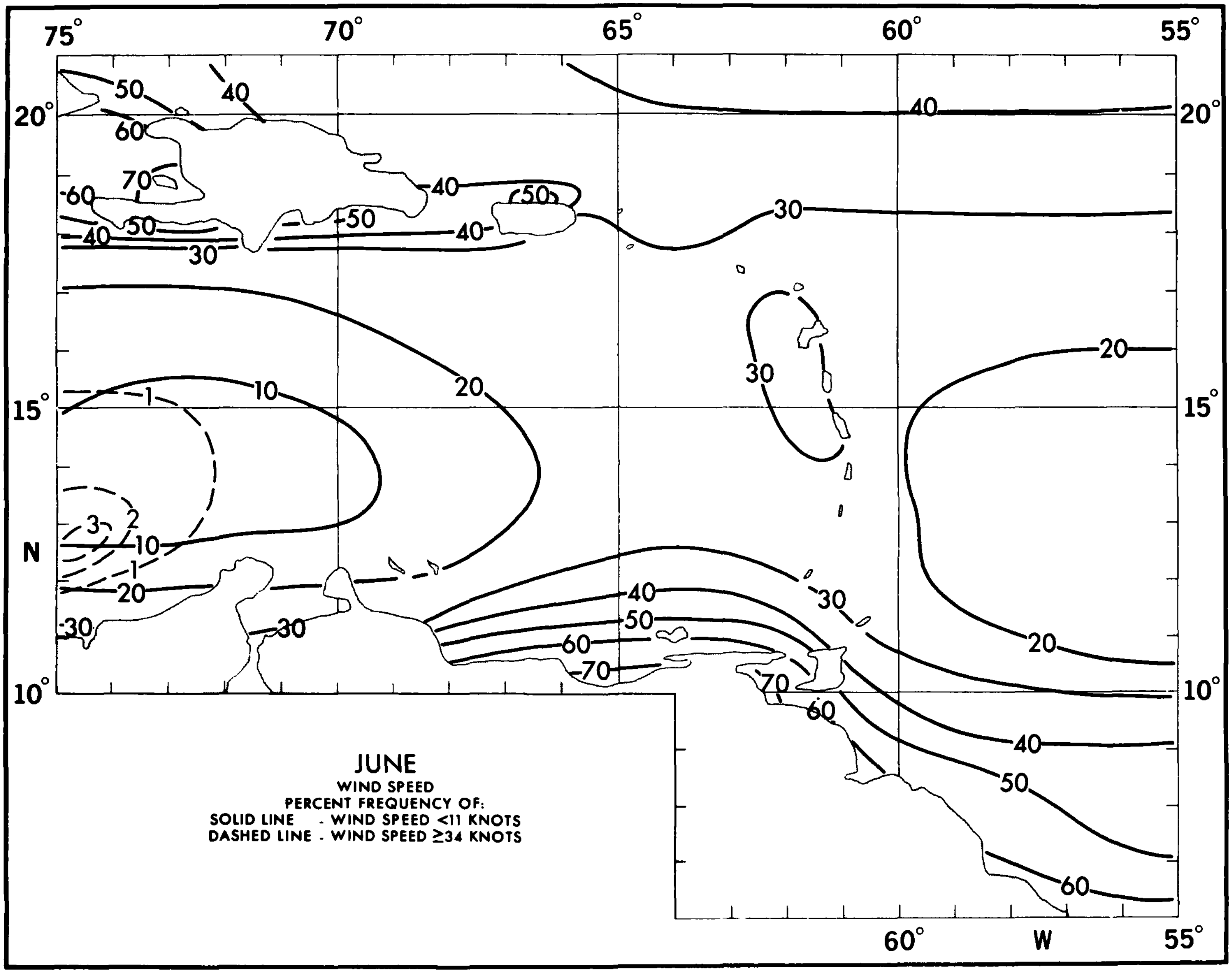


JUNE
CEILING-VISIBILITY (LOW RANGE)
PERCENT FREQUENCY OF:
SOLID LINE - CEILING <300 FEET AND/OR VISIBILITY <1 N. MILE
DASHED LINE - CEILING <600 FEET AND/OR VISIBILITY <2 N. MILES

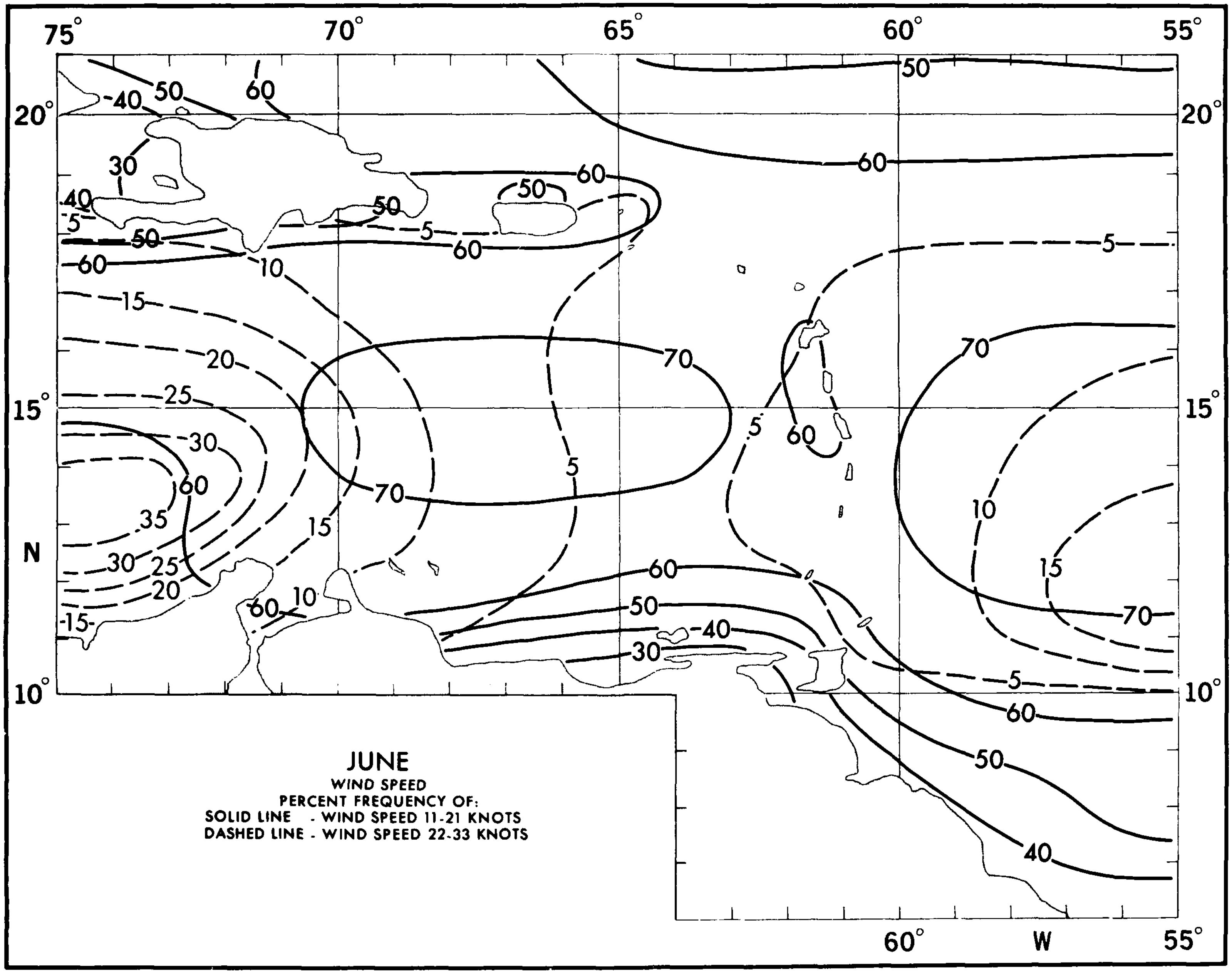

75°
70°
65°
60°
55°
20°
15°
10°
N
W
JUNE
WIND-VISIBILITY-CLOUDINESS
SOLID LINE - PERCENT FREQUENCY OF OPTIMUM CONDITIONS: LCC ≥5000 FT., (OR NO LCC), VSBY. ≥5 N. MI. AND WIND 11-21 KTS.
DASHED LINE - PERCENT FREQUENCY OF POOR CONDITIONS. ANY ONE OF THE FOLLOWING CONSTITUTES POOR CONDITIONS: LCC <300 FT., VSBY. <1 N. MI., WIND <6 OR ≥34 KTS.



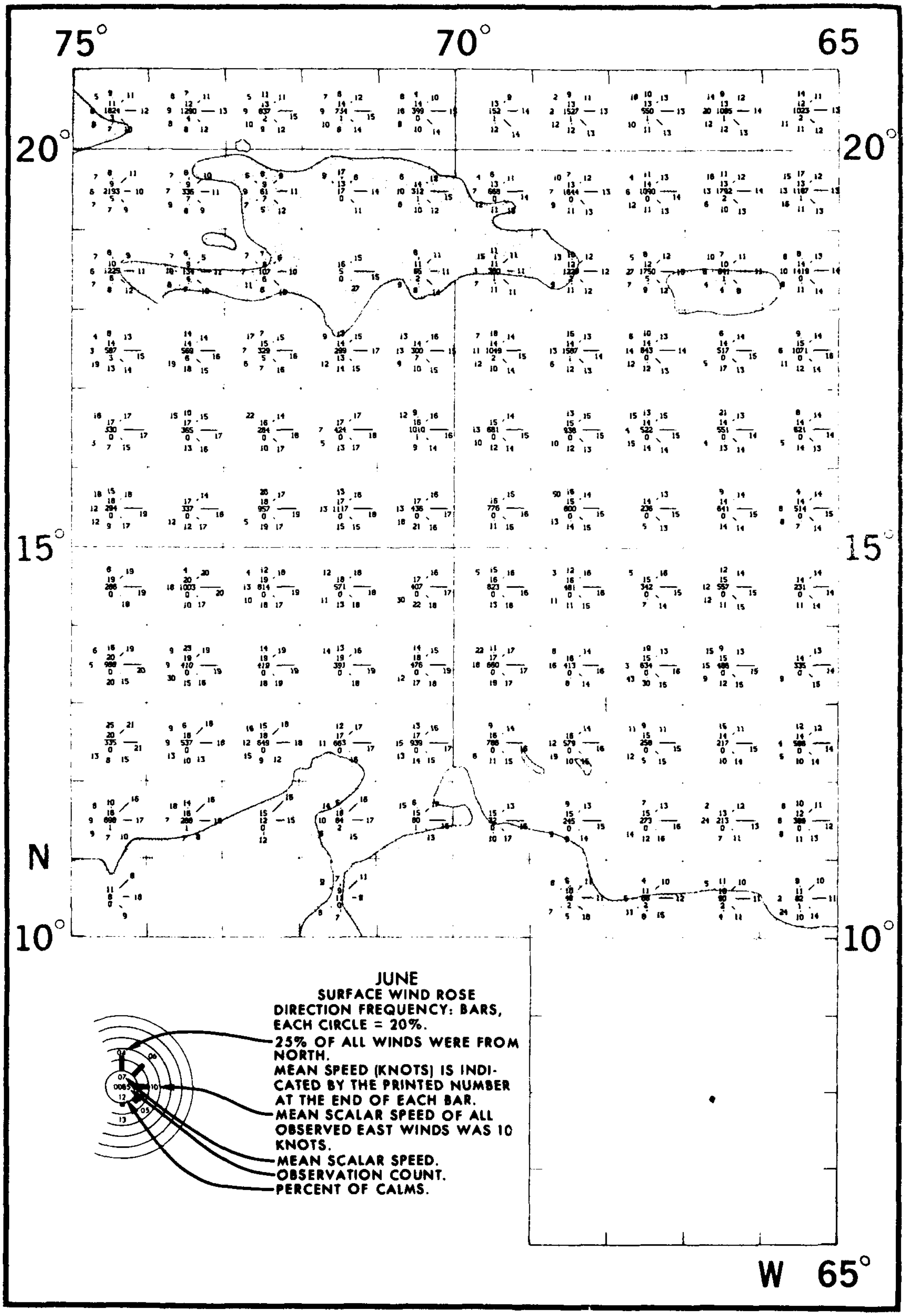
JUNE
WIND SPEED
MEAN SCALAR WIND SPEED (Knots)



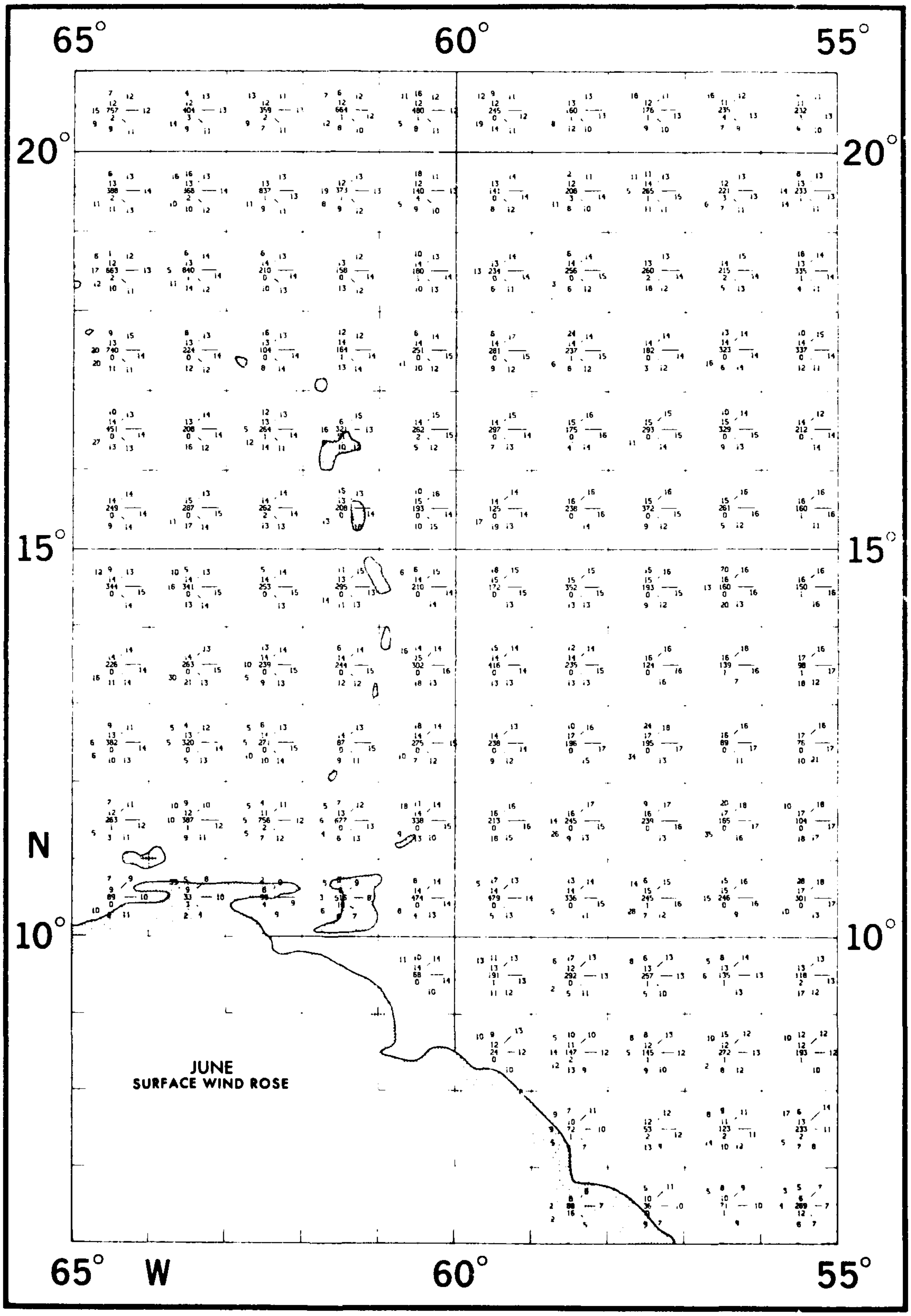
JUNE
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE - WIND SPEED <11 KNOTS
DASHED LINE - WIND SPEED ≥34 KNOTS

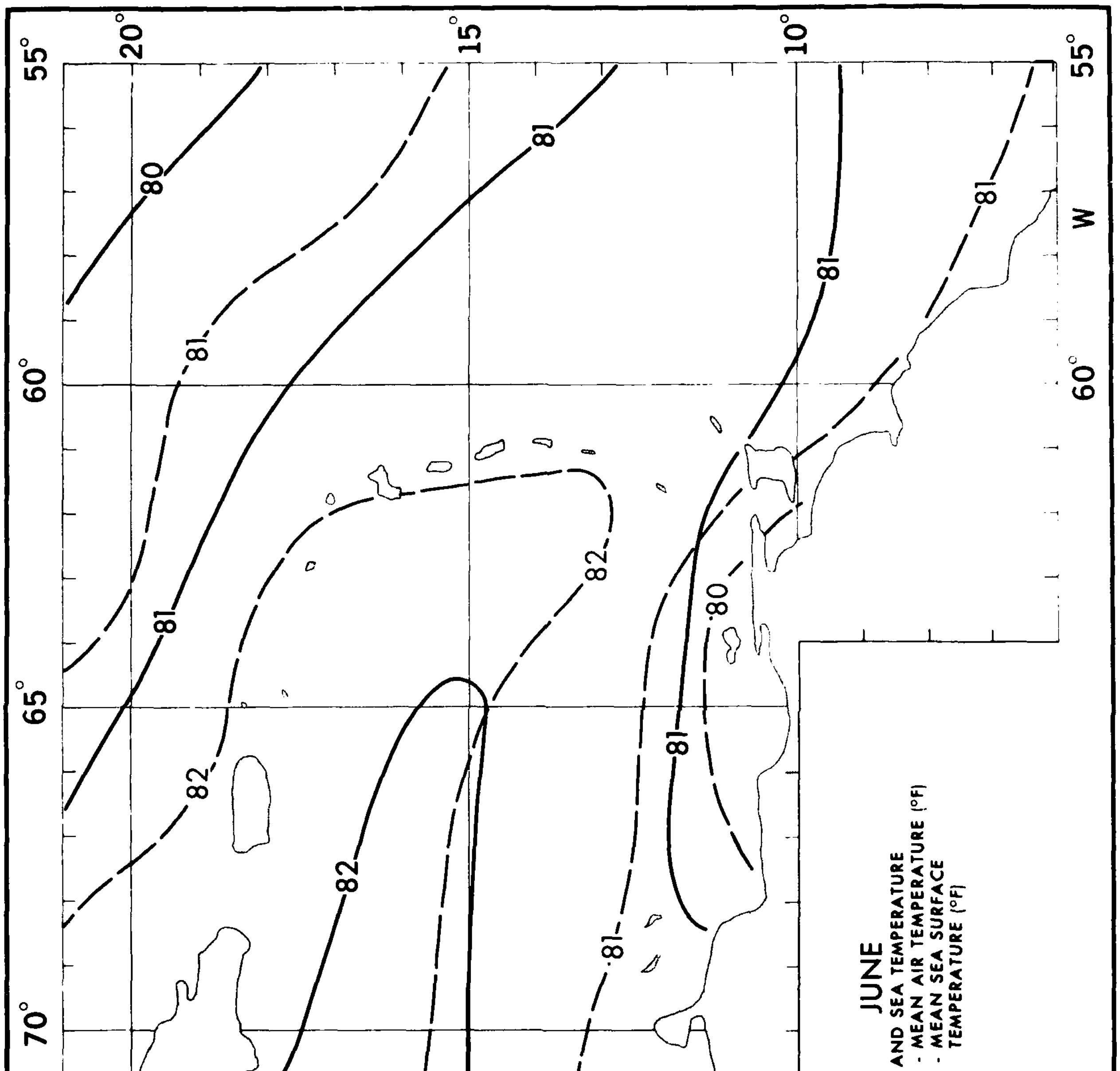


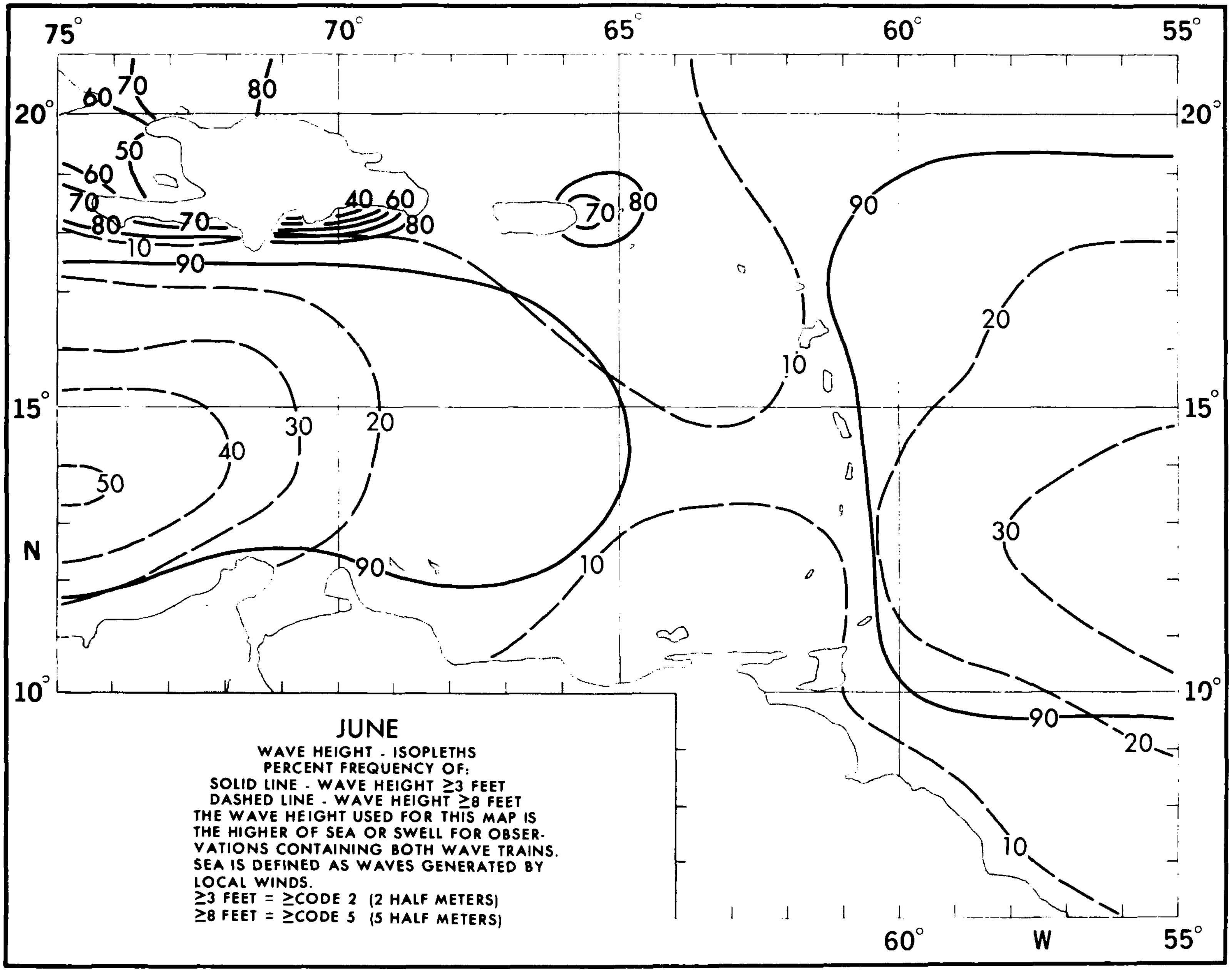
JUNE
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE - WIND SPEED 11-21 KNOTS
DASHED LINE - WIND SPEED 22-33 KNOTS

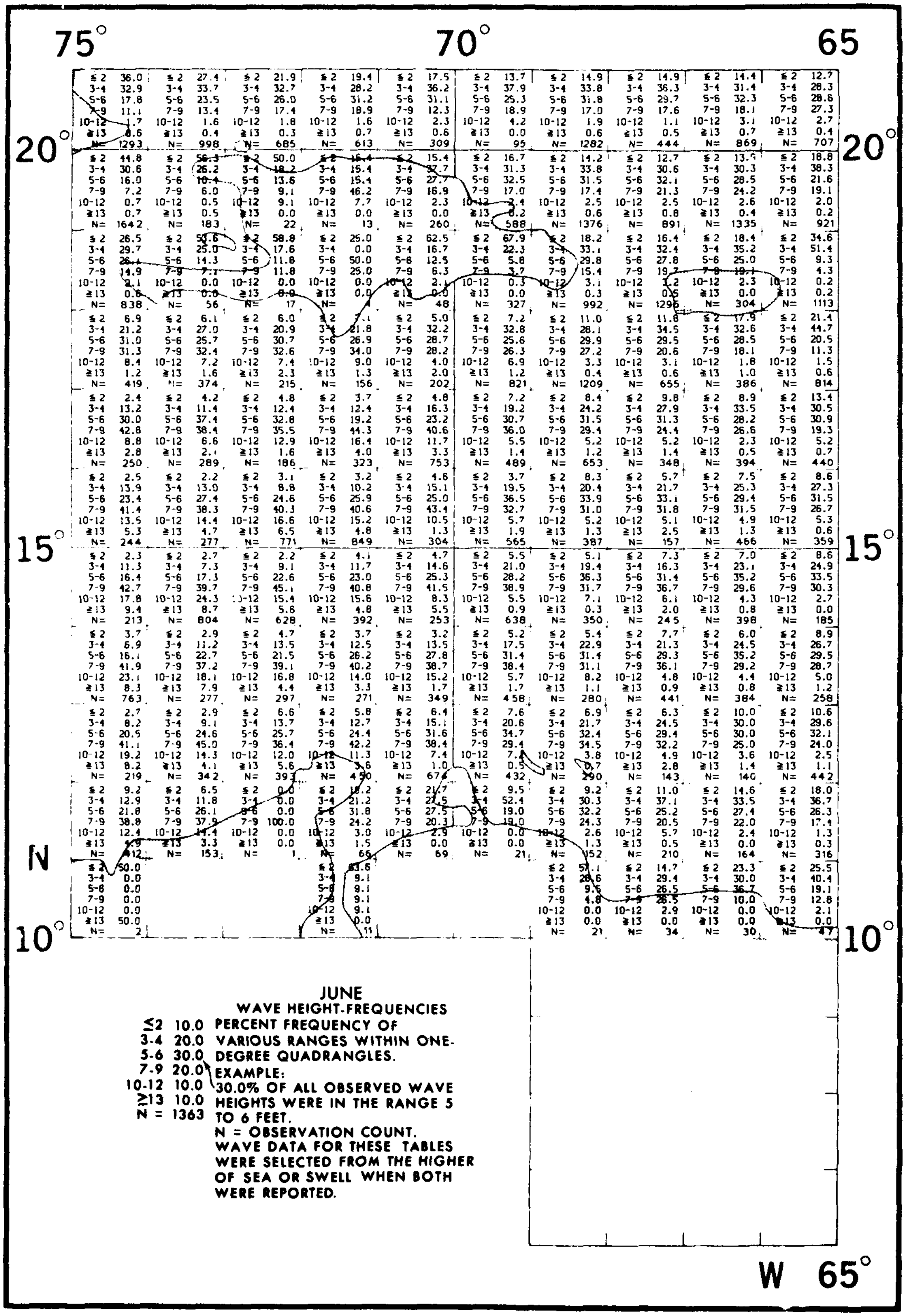


75°
70°
65
20°
20°
15°
15°
N
10°
10°
JUNE
SURFACE WIND ROSE
DIRECTION FREQUENCY: BARS, EACH CIRCLE = 20%.
25% OF ALL WINDS WERE FROM NORTH.
MEAN SPEED (KNOTS) IS INDICATED BY THE PRINTED NUMBER AT THE END OF EACH BAR.
MEAN SCALAR SPEED OF ALL OBSERVED EAST WINDS WAS 10 KNOTS.
MEAN SCALAR SPEED.
OBSERVATION COUNT.
PERCENT OF CALMS.
W 65°

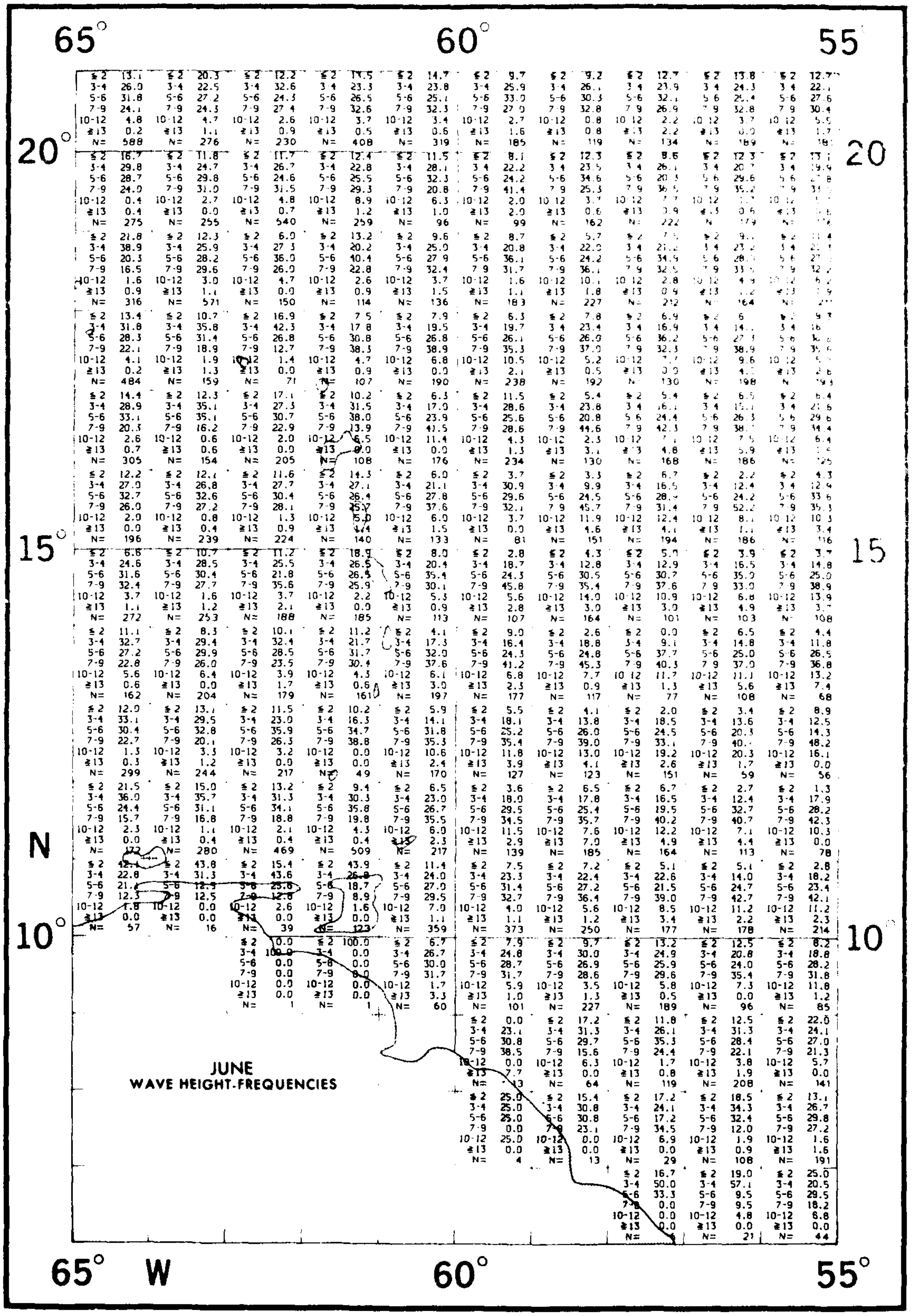

65°
60°
55°
20°
15°
10°
N
W
JUNE
SURFACE WIND ROSE

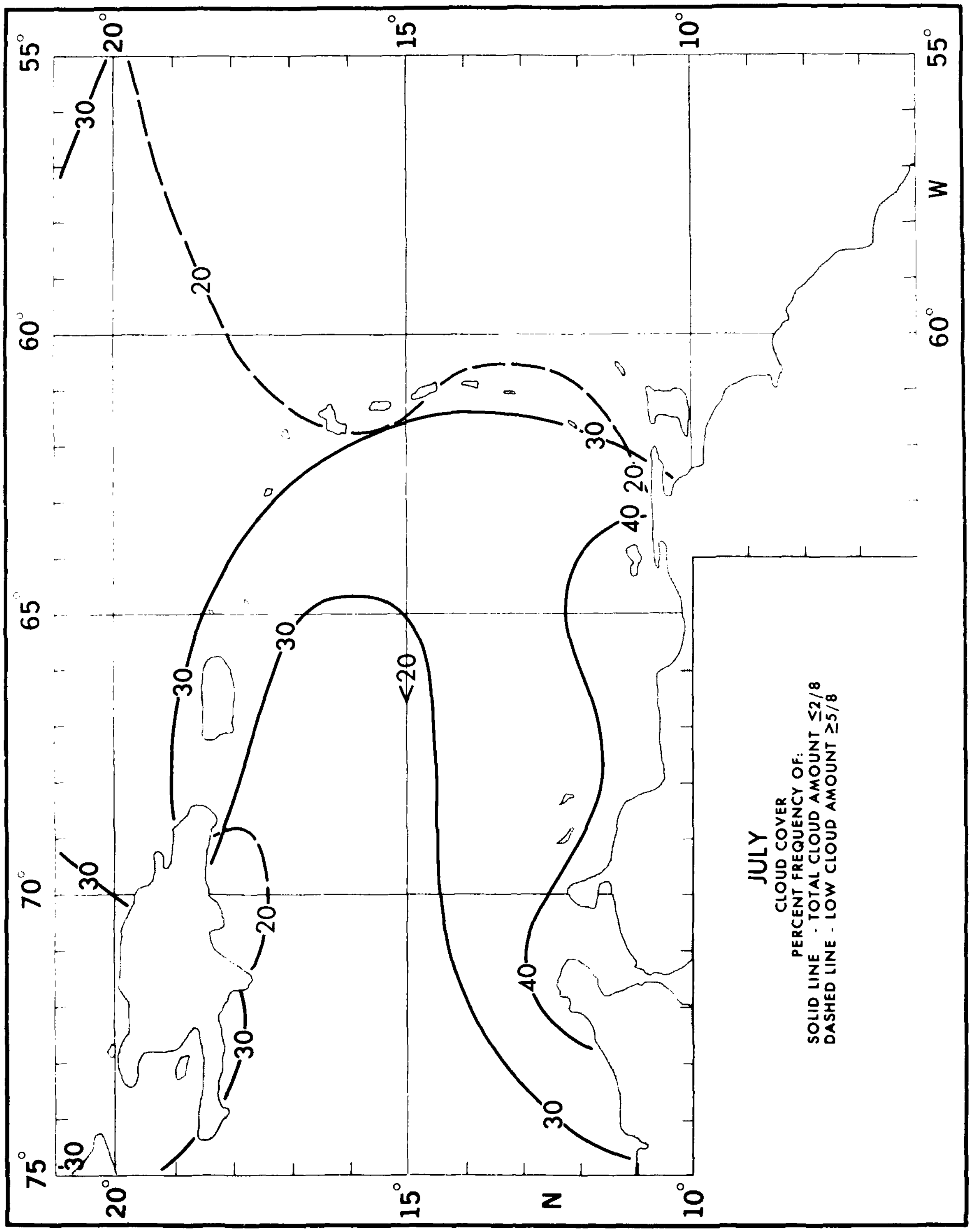

JUNE
AIR AND SEA TEMPERATURE
SOLID LINE - MEAN AIR TEMPERATURE (°F)
DASHED LINE - MEAN SEA SURFACE TEMPERATURE (°F)
75°
70°
65°
60°
55°
20°
15°
10°
N
W
80
81
82
83

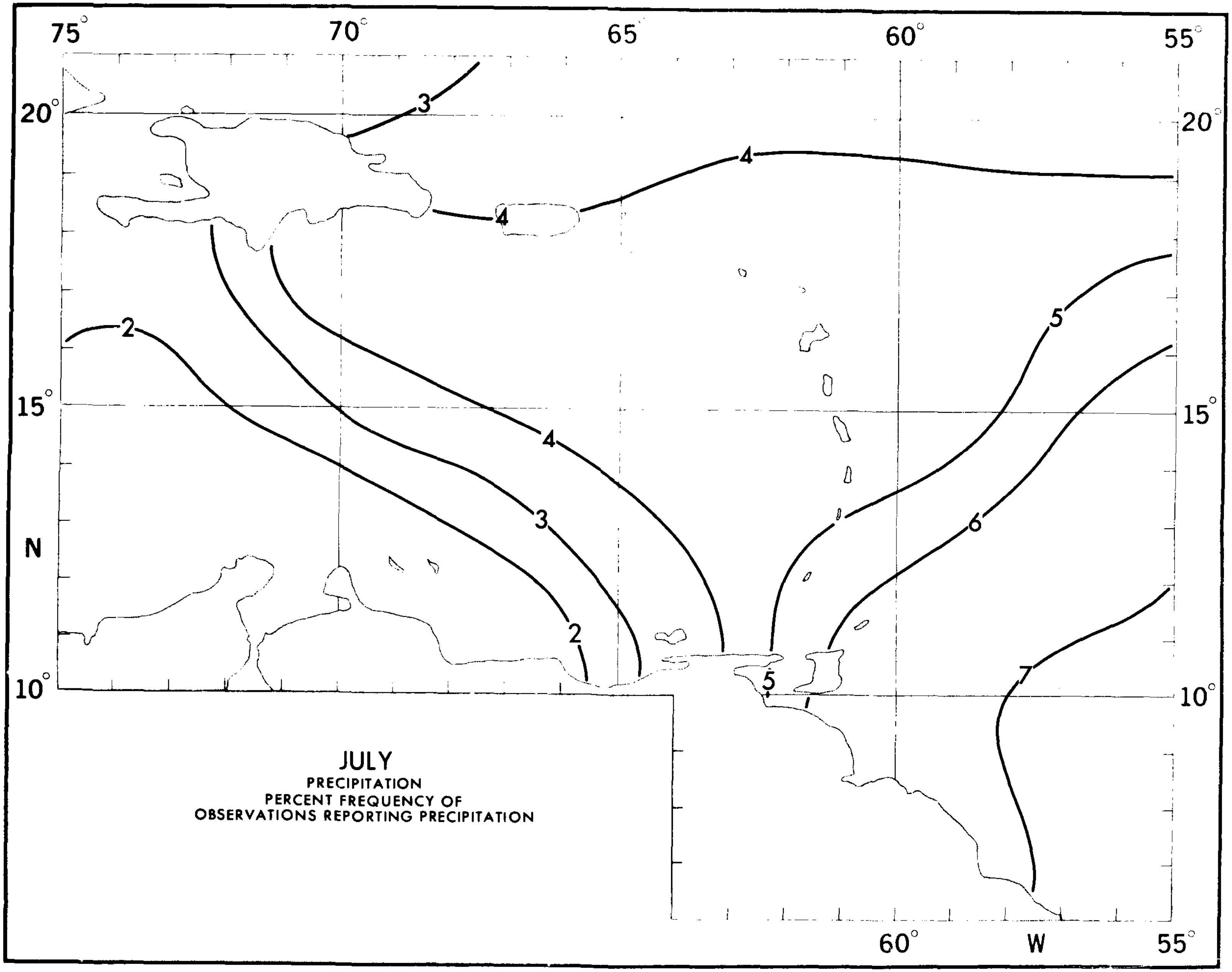

75°
70°
65°
60°
55°
20°
15°
10°
N
W
JUNE
WAVE HEIGHT - ISOPLETHS
PERCENT FREQUENCY OF:
SOLID LINE - WAVE HEIGHT ≥3 FEET
DASHED LINE - WAVE HEIGHT ≥8 FEET
THE WAVE HEIGHT USED FOR THIS MAP IS
THE HIGHER OF SEA OR SWELL FOR OBSER-
VATIONS CONTAINING BOTH WAVE TRAINS.
SEA IS DEFINED AS WAVES GENERATED BY
LOCAL WINDS.
≥3 FEET = ≥CODE 2 (2 HALF METERS)
≥8 FEET = ≥CODE 5 (5 HALF METERS)



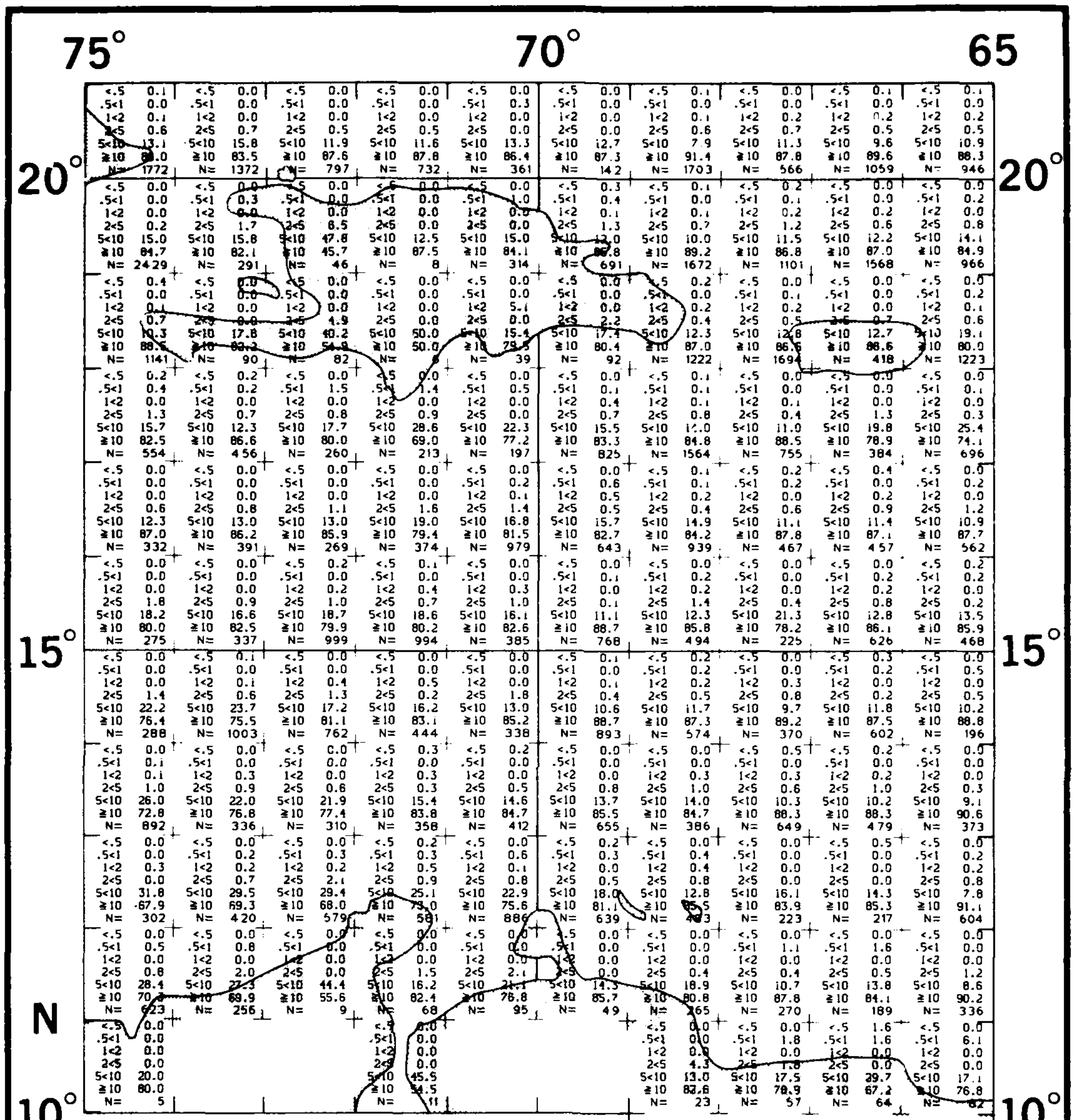
75°
70°
65
20°
15°
10°
N
W 65°
JUNE
WAVE HEIGHT-FREQUENCIES
≤2 10.0
3-4 20.0
5-6 30.0
7-9 20.0
10-12 10.0
≥13 10.0
N = 1363
PERCENT FREQUENCY OF VARIOUS RANGES WITHIN ONE-DEGREE QUADRANGLES.
EXAMPLE:
30.0% OF ALL OBSERVED WAVE HEIGHTS WERE IN THE RANGE 5 TO 6 FEET.
N = OBSERVATION COUNT.
WAVE DATA FOR THESE TABLES WERE SELECTED FROM THE HIGHER OF SEA OR SWELL WHEN BOTH WERE REPORTED.


65°
60°
55°
20°
20
15°
15
N
10°
10
65° W
60°
55°
JUNE
WAVE HEIGHT-FREQUENCIES


JULY
CLOUD COVER
PERCENT FREQUENCY OF:
SOLID LINE - TOTAL CLOUD AMOUNT ≤2/8
DASHED LINE - LOW CLOUD AMOUNT ≥5/8
N
W
20°
15°
10°
55°
60°
65°
70°
75°
30
20
40
<20



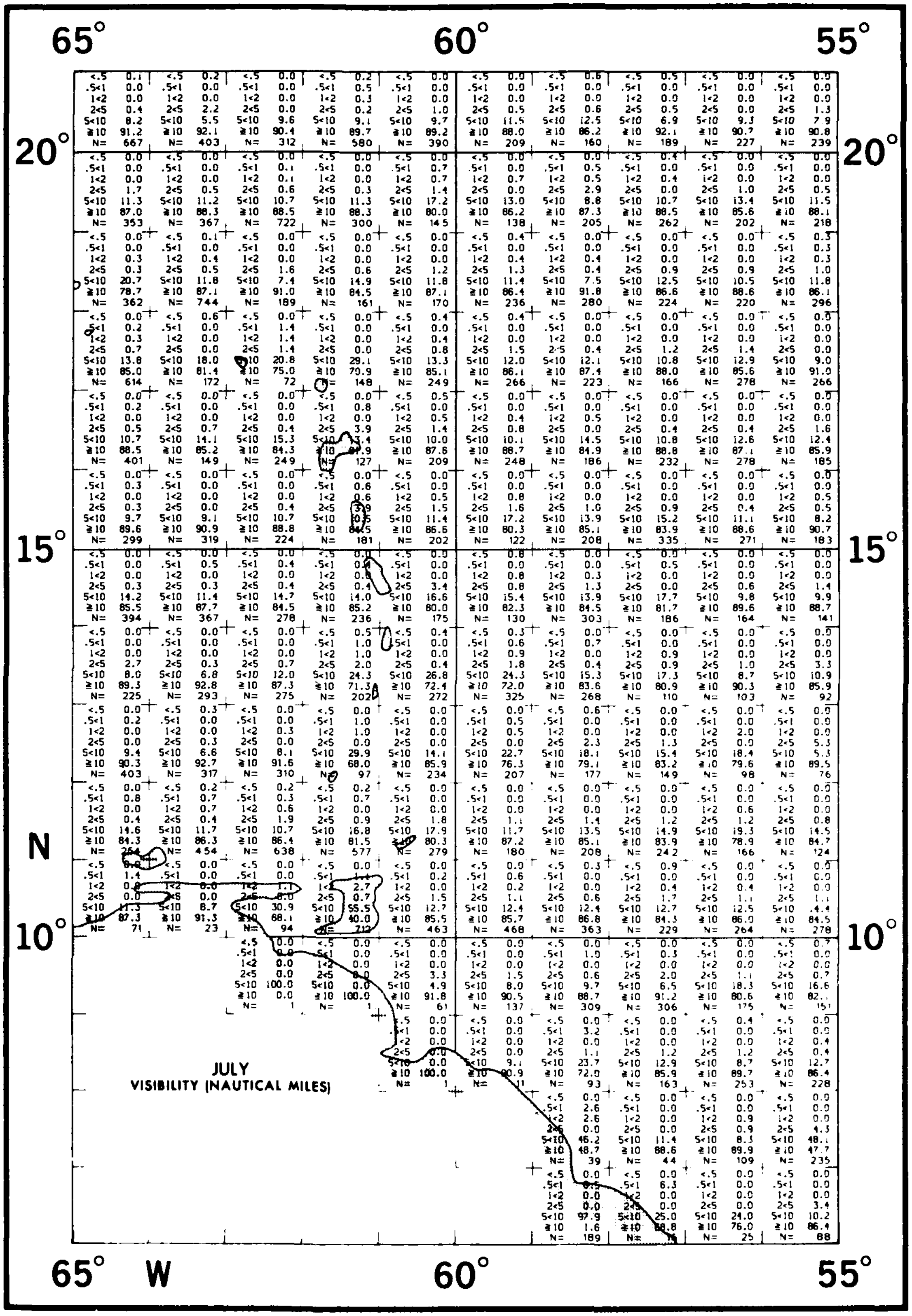
JULY
PRECIPITATION
PERCENT FREQUENCY OF
OBSERVATIONS REPORTING PRECIPITATION



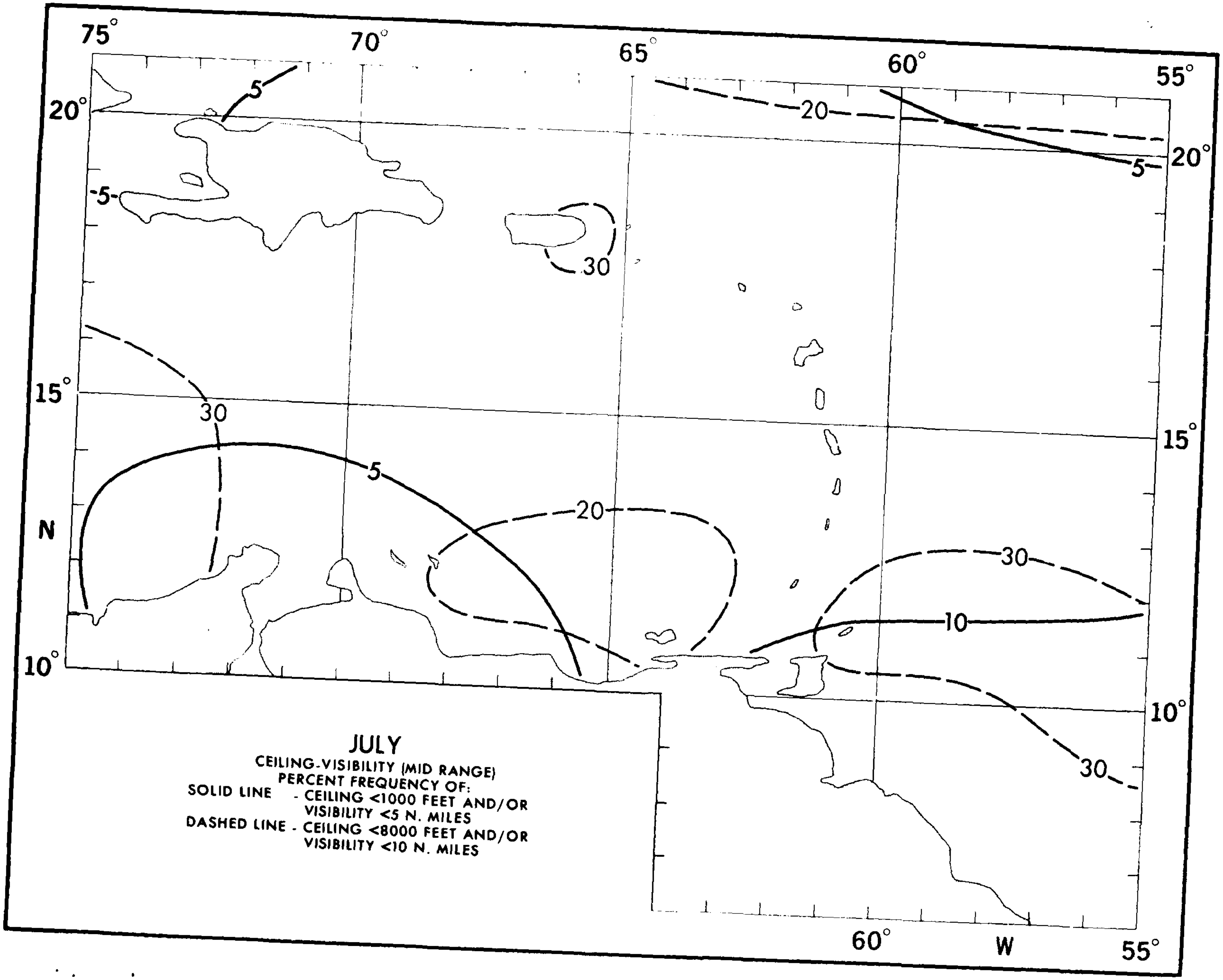
JULY

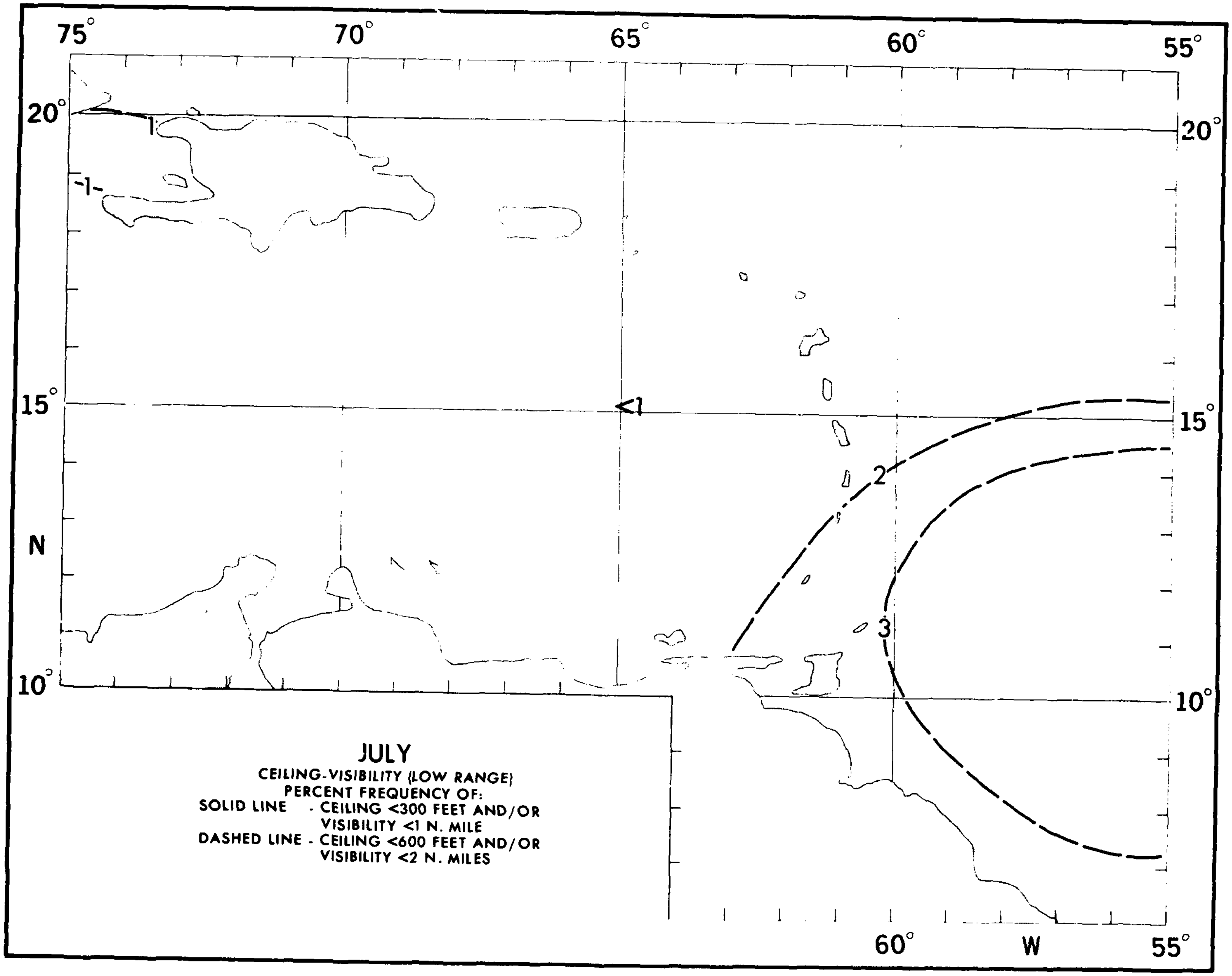
VISIBILITY (NAUTICAL MILES)
PERCENT FREQUENCY OF
VARIOUS RANGES WITHIN ONE-
DEGREE QUADRANGLES.
EXAMPLE:
3.1% OF THE OBSERVED VISIBILI-
TIES WERE <1 BUT ≥1/2 N. MILE.
OTHER PERCENTAGES CAN BE
SIMILARLY INTERPRETED.
N = OBSERVATION COUNT.

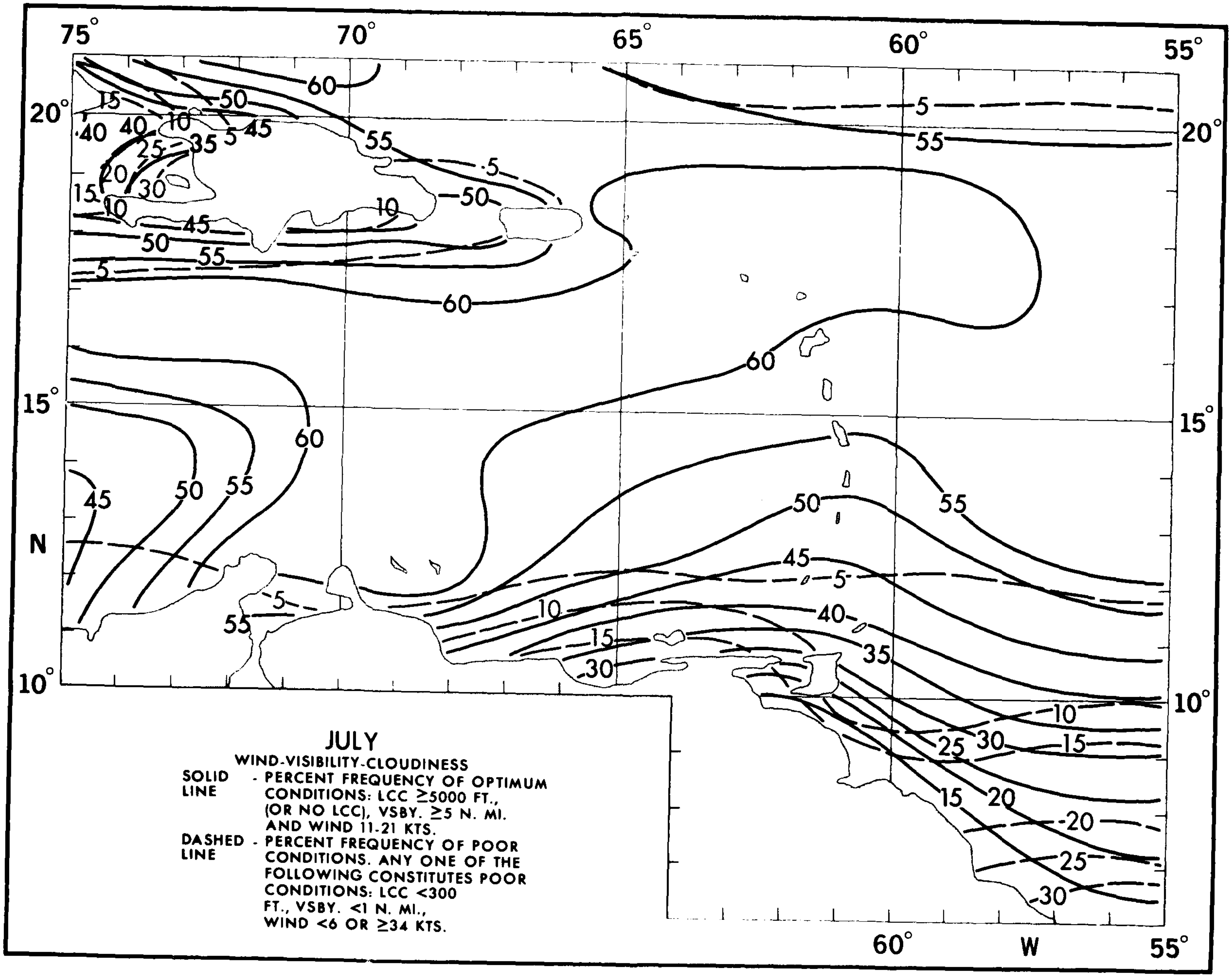
<.5	.2
.5 <1	3.1
1 <2	6.7
2 <5	10.0
5 <10	60.0
≥10	20.0
N =	1234

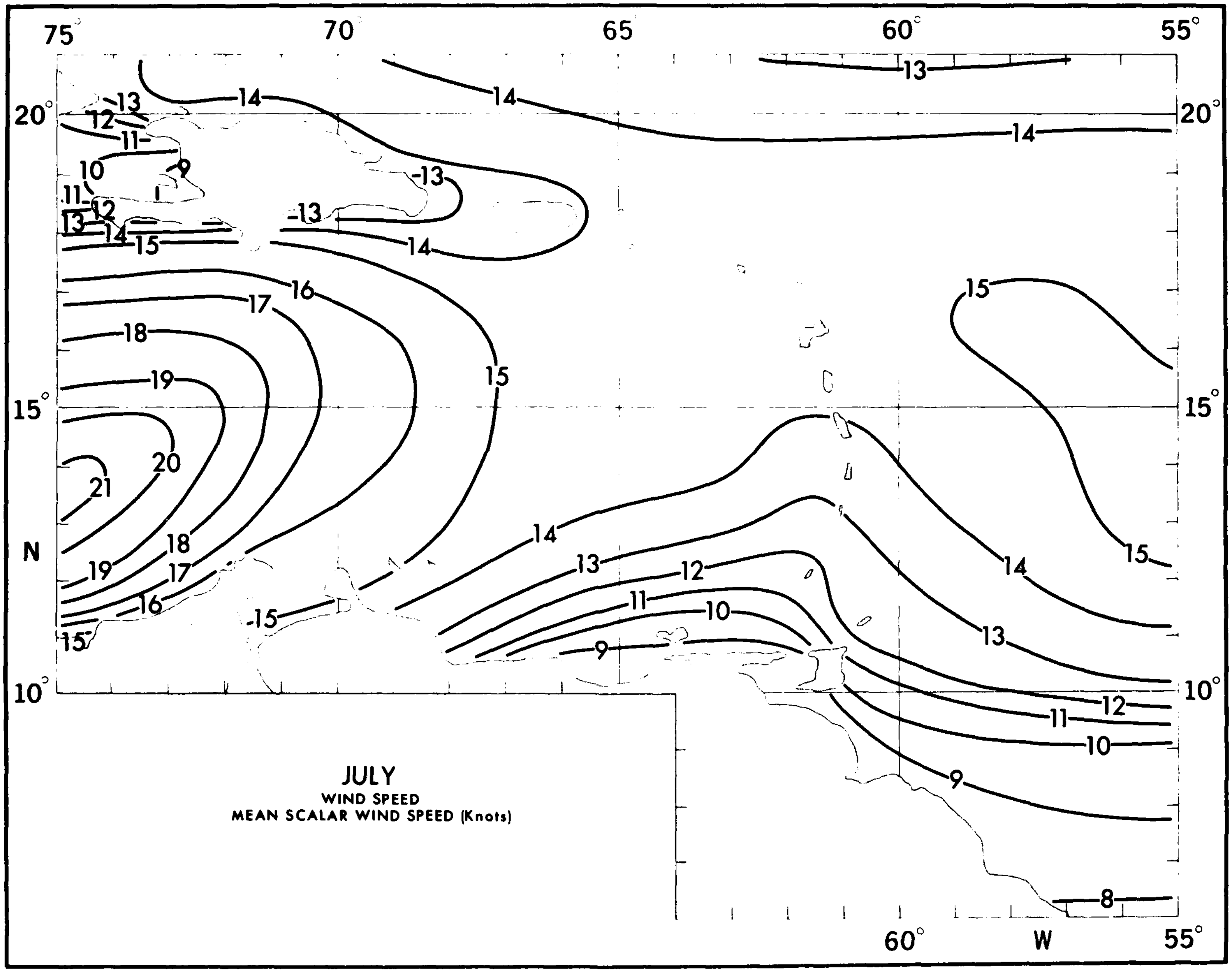


65°
60°
55°
20°
15°
N
10°
W
JULY
VISIBILITY (NAUTICAL MILES)

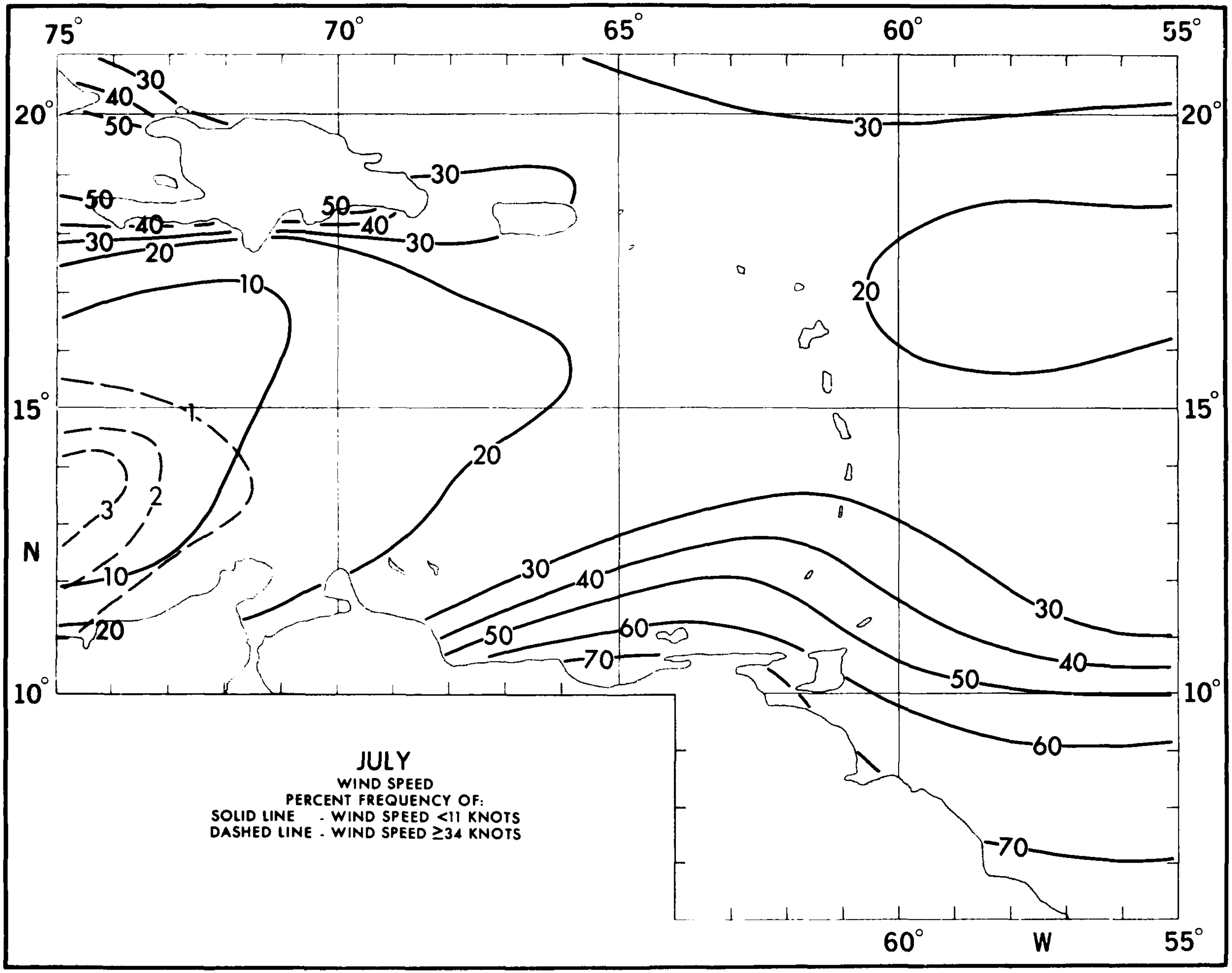

75°
70°
65°
60°
55°
20°
15°
10°
N
W
5
20
30
10
JULY
CEILING-VISIBILITY (MID RANGE)
PERCENT FREQUENCY OF:
SOLID LINE - CEILING <1000 FEET AND/OR VISIBILITY <5 N. MILES
DASHED LINE - CEILING <8000 FEET AND/OR VISIBILITY <10 N. MILES


75°
70°
65°
60°
55°
20°
15°
10°
N
W
1
-1-
<1
2
3
JULY
CEILING-VISIBILITY (LOW RANGE)
PERCENT FREQUENCY OF:
SOLID LINE - CEILING <300 FEET AND/OR VISIBILITY <1 N. MILE
DASHED LINE - CEILING <600 FEET AND/OR VISIBILITY <2 N. MILES

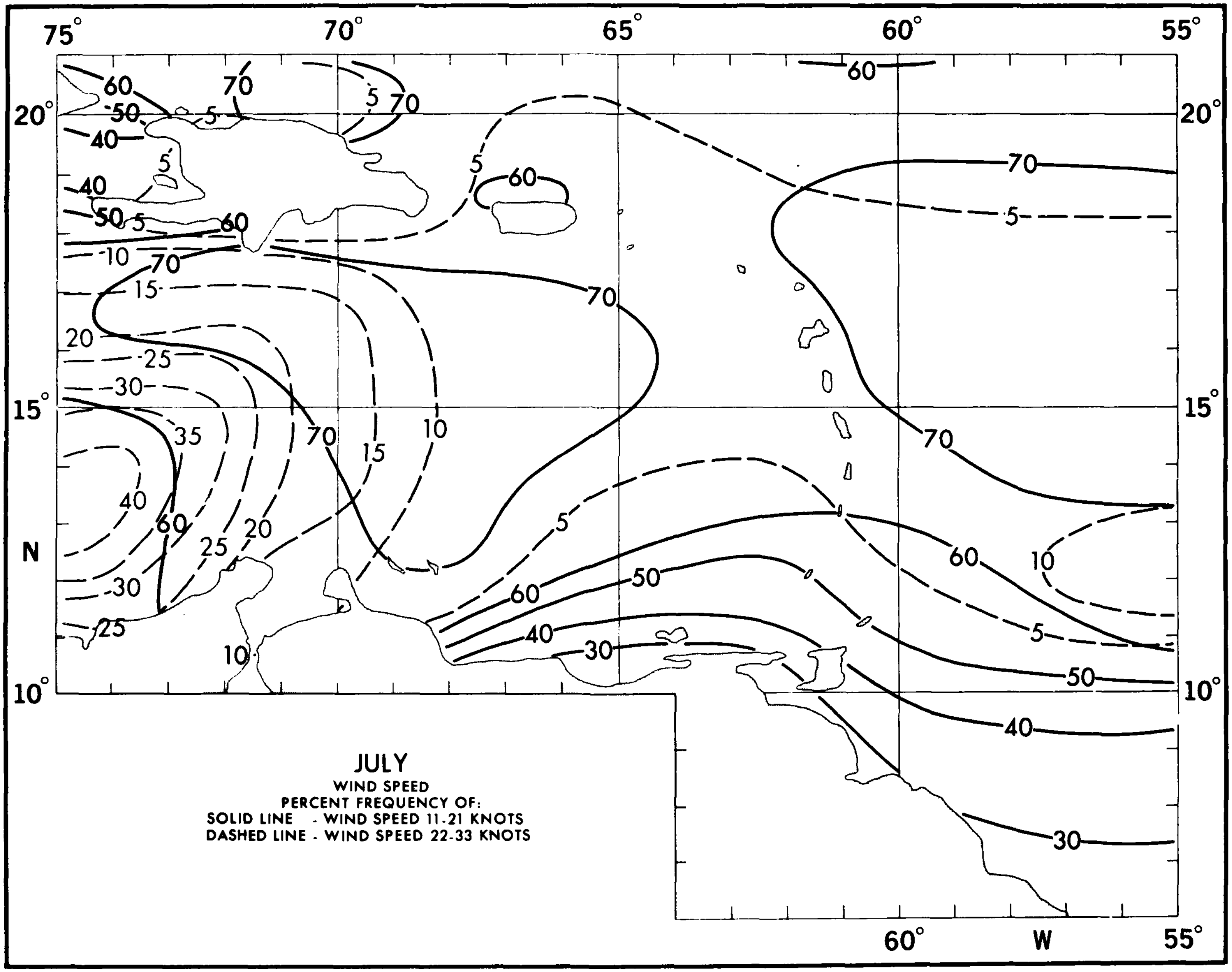

75° 70° 65° 60° 55°
20° 15° N 10°
60° W 55°
JULY
WIND-VISIBILITY-CLOUDINESS
SOLID LINE - PERCENT FREQUENCY OF OPTIMUM CONDITIONS: LCC ≥5000 FT., (OR NO LCC), VSBY. ≥5 N. MI. AND WIND 11-21 KTS.
DASHED LINE - PERCENT FREQUENCY OF POOR CONDITIONS. ANY ONE OF THE FOLLOWING CONSTITUTES POOR CONDITIONS: LCC <300 FT., VSBY. <1 N. MI., WIND <6 OR ≥34 KTS.



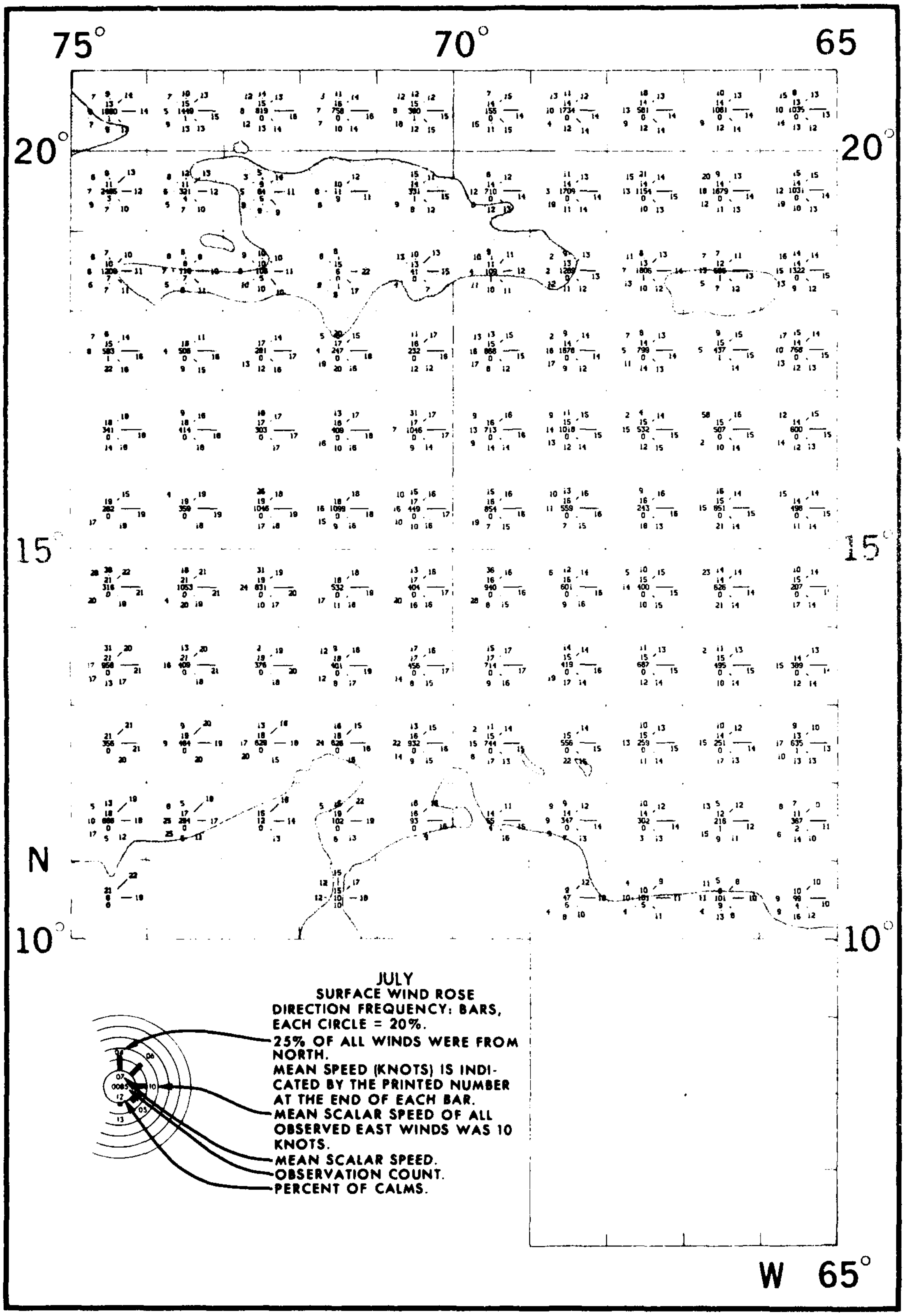
JULY
WIND SPEED
MEAN SCALAR WIND SPEED (Knots)

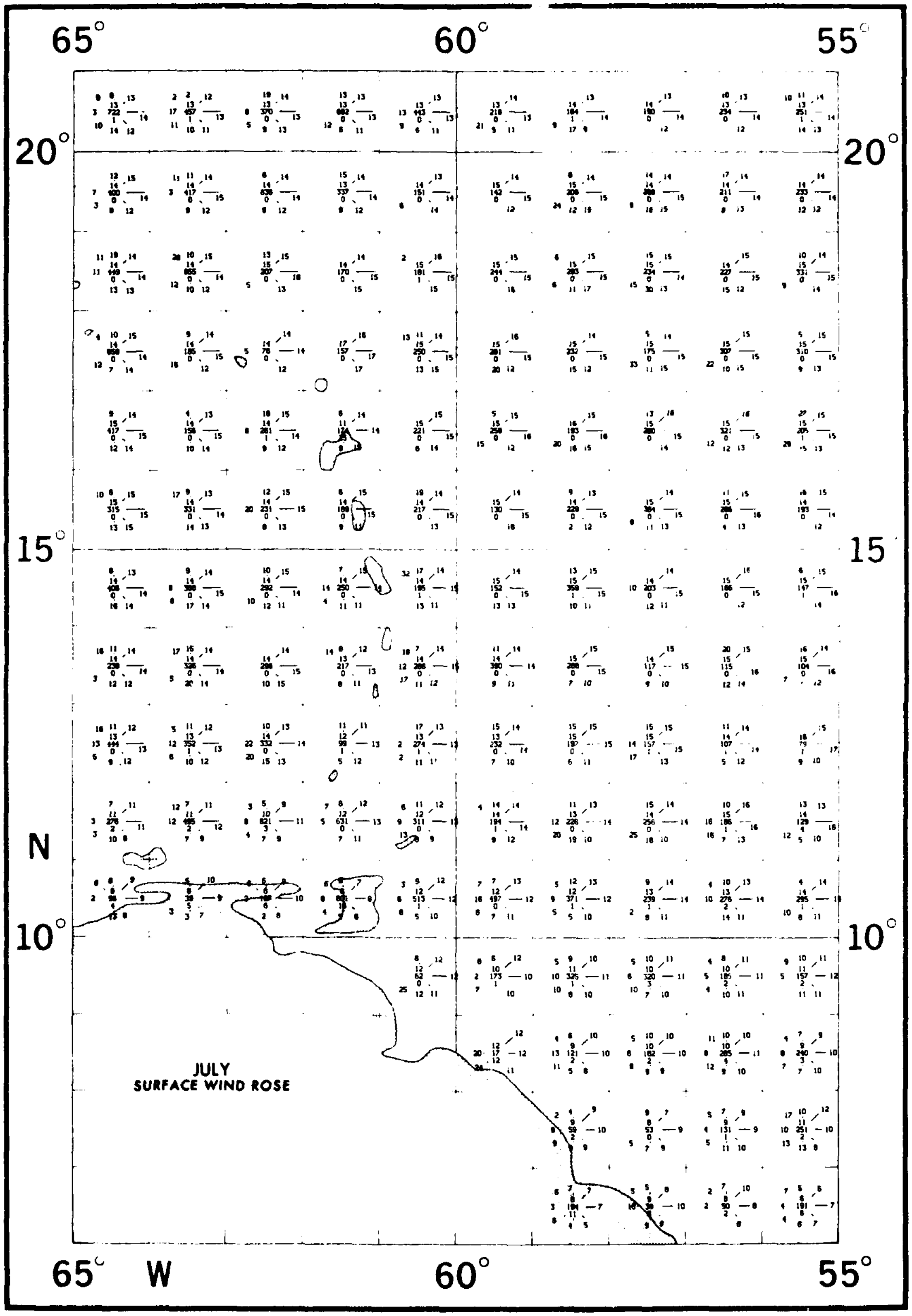


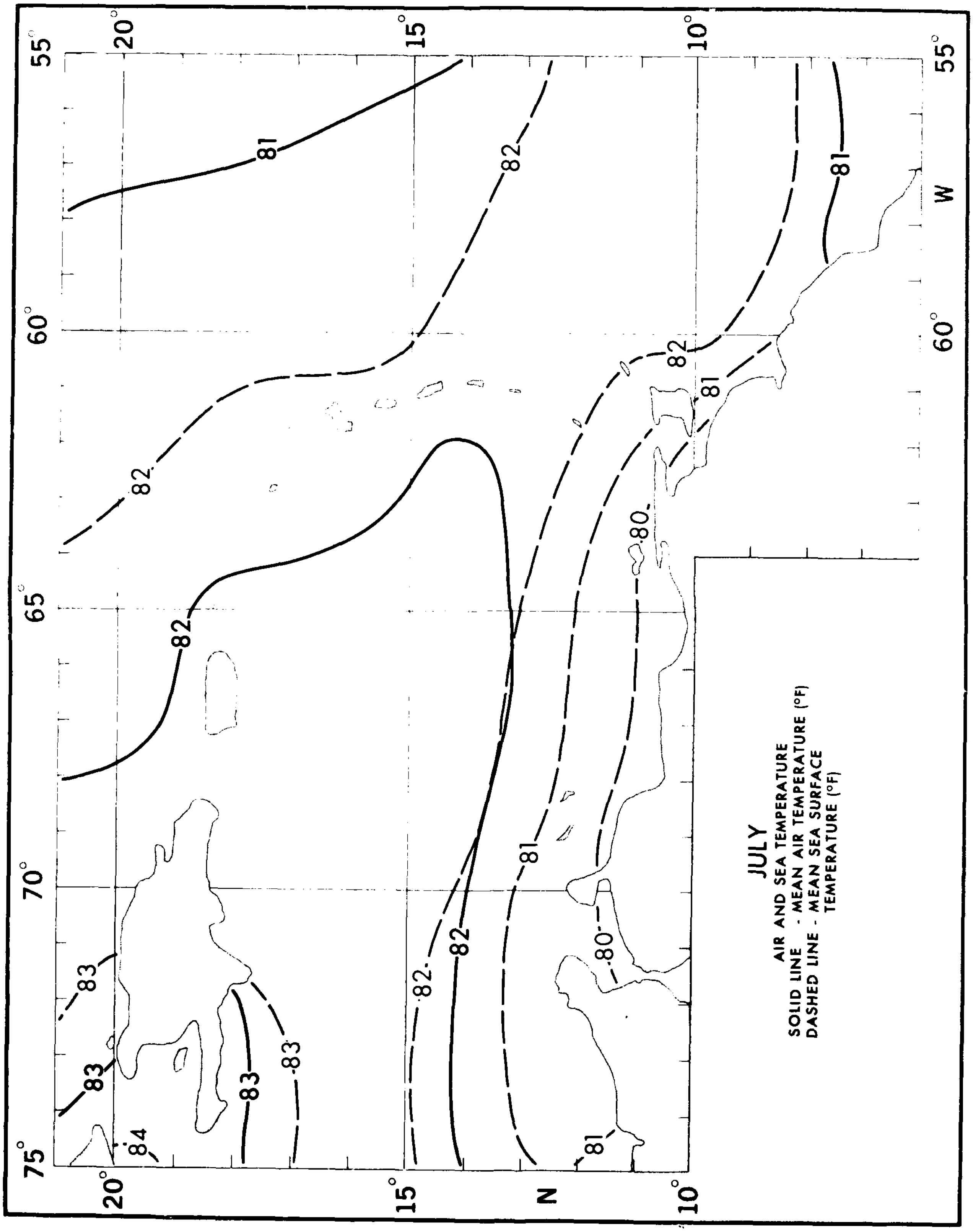
JULY
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE - WIND SPEED <11 KNOTS
DASHED LINE - WIND SPEED ≥34 KNOTS

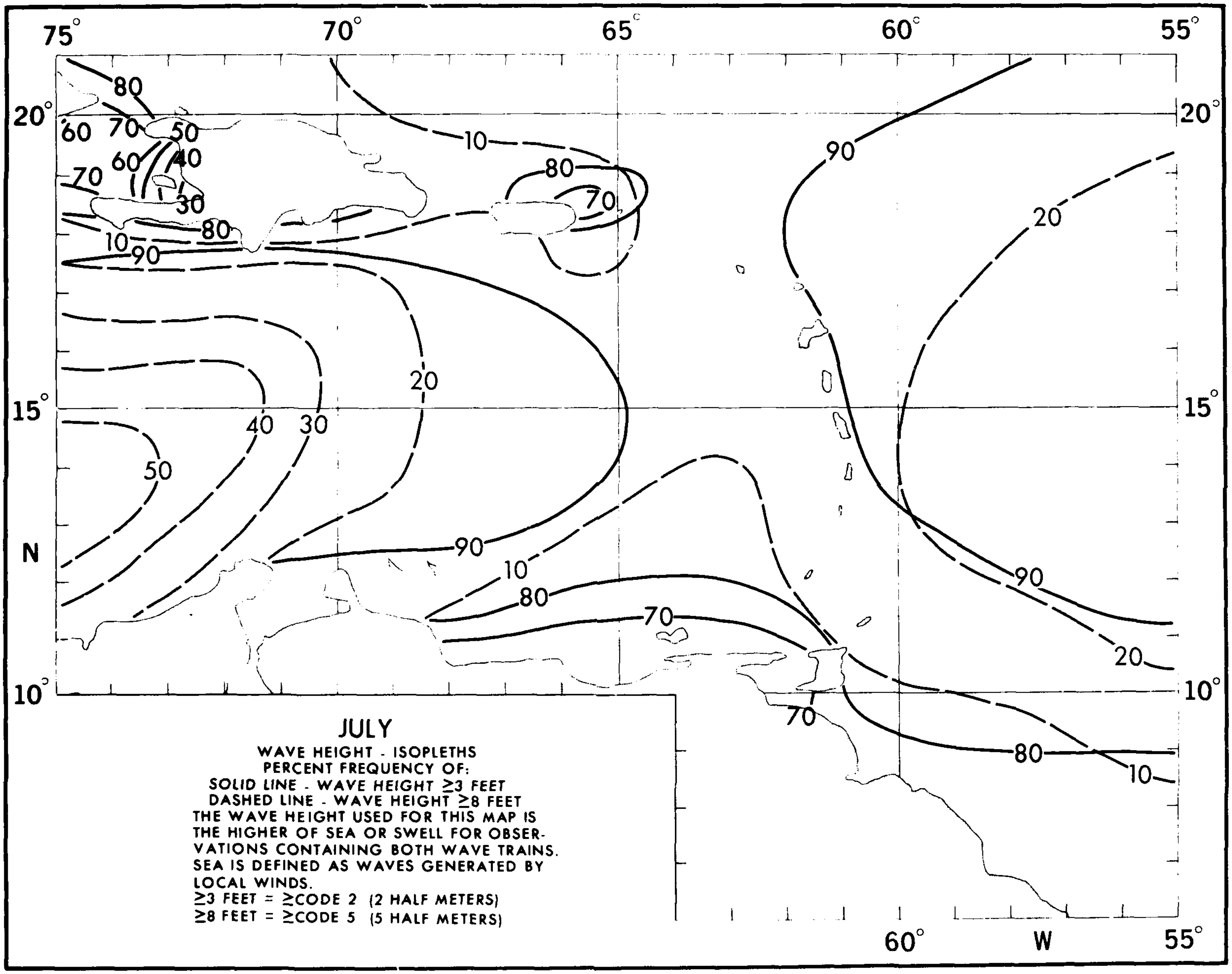


JULY
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE - WIND SPEED 11-21 KNOTS
DASHED LINE - WIND SPEED 22-33 KNOTS


75°
70°
65
20°
20°
15°
15°
N
10°
10°
JULY
SURFACE WIND ROSE
DIRECTION FREQUENCY: BARS, EACH CIRCLE = 20%.
25% OF ALL WINDS WERE FROM NORTH.
MEAN SPEED (KNOTS) IS INDICATED BY THE PRINTED NUMBER AT THE END OF EACH BAR.
MEAN SCALAR SPEED OF ALL OBSERVED EAST WINDS WAS 10 KNOTS.
MEAN SCALAR SPEED.
OBSERVATION COUNT.
PERCENT OF CALMS.
W 65°


65°
60°
55°
20°
15°
10°
N
W
JULY
SURFACE WIND ROSE


JULY
AIR AND SEA TEMPERATURE
SOLID LINE - MEAN AIR TEMPERATURE (°F)
DASHED LINE - MEAN SEA SURFACE TEMPERATURE (°F)
75°
70°
65°
60°
55°
20°
15°
10°
N
W
80
81
82
83
84


75°
70°
65°
60°
55°
20°
15°
10°
N
W
JULY
WAVE HEIGHT - ISOPLETHS
PERCENT FREQUENCY OF:
SOLID LINE - WAVE HEIGHT ≥3 FEET
DASHED LINE - WAVE HEIGHT ≥8 FEET
THE WAVE HEIGHT USED FOR THIS MAP IS
THE HIGHER OF SEA OR SWELL FOR OBSER-
VATIONS CONTAINING BOTH WAVE TRAINS.
SEA IS DEFINED AS WAVES GENERATED BY
LOCAL WINDS.
≥3 FEET = ≥CODE 2 (2 HALF METERS)
≥8 FEET = ≥CODE 5 (5 HALF METERS)

75° 70° 65°

≤2	20.5	17.8	11.6	10.3	13.8	11.0	11.0	11.4	11.0	10.4
3-4	29.3	30.9	30.7	29.0	34.8	33.0	29.7	29.1	26.9	23.9
5-6	27.9	26.2	30.0	32.5	27.6	28.4	29.3	27.5	30.7	28.9
7-9	19.1	21.1	24.7	23.5	20.1	22.0	26.0	28.1	26.4	30.7
10-12	2.4	3.5	2.2	4.0	3.4	3.7	3.3	3.4	3.9	4.6
≥13	0.8	0.4	0.9	0.8	0.3	1.8	0.7	0.6	1.1	1.5
N=	1283	1161	697	631	319	109	1459	499	935	733

20° 20°

≤2	31.3	35.2	60.5	28.6	13.6	12.9	10.3	8.4	8.6	13.6
3-4	33.6	36.3	15.8	57.1	33.0	33.0	30.5	26.7	24.8	29.3
5-6	20.8	13.4	13.2	14.3	25.4	29.2	31.6	29.4	30.3	26.3
7-9	12.1	12.8	7.9	0.0	23.1	21.4	23.6	29.3	30.0	27.3
10-12	1.8	1.1	0.0	0.0	3.8	2.8	3.3	5.6	5.3	3.1
≥13	0.4	1.1	2.6	0.0	1.1	0.6	0.6	0.6	1.1	0.5
N=	1852	179	38	7	264	636	1442	956	1284	811

≤2	29.1	47.2	71.7	20.0	8.3	21.8	13.9	13.3	23.3	38.6
3-4	28.6	37.7	15.2	20.0	33.3	46.2	30.0	26.5	33.5	42.5
5-6	23.3	9.4	8.7	0.0	22.2	19.2	27.9	29.4	23.3	11.6
7-9	15.5	3.8	4.3	60.0	33.3	12.8	24.1	25.3	16.0	6.6
10-12	2.7	1.9	0.0	0.0	0.0	0.0	3.6	4.1	2.3	0.6
≥13	0.9	0.0	0.0	0.0	2.8	0.0	0.6	1.6	1.5	0.2
N=	821	53	46	5	36	78	1031	1396	343	1036

≤2	8.5	5.5	5.9	8.4	7.5	7.2	9.1	12.9	11.7	18.6
3-4	21.8	17.5	20.6	22.9	15.5	21.6	25.9	30.1	31.0	42.3
5-6	29.8	31.9	28.9	22.3	29.2	27.2	27.2	29.2	30.7	23.4
7-9	31.5	36.2	35.8	36.1	38.5	33.3	31.6	23.4	22.6	13.2
10-12	7.5	7.8	4.9	7.2	5.6	8.4	5.2	3.9	3.3	1.4
≥13	0.9	1.1	3.9	3.0	3.7	2.3	0.9	0.5	0.6	1.1
N=	426	348	204	166	161	699	1259	644	332	560

≤2	1.8	4.1	2.4	3.6	3.7	5.4	8.2	6.0	8.2	9.6
3-4	13.1	15.2	13.0	13.4	13.8	16.3	23.8	23.3	30.2	27.4
5-6	29.8	29.0	34.8	22.1	23.2	27.6	29.3	32.1	28.5	28.1
7-9	36.9	39.9	38.6	43.3	42.3	40.7	29.8	31.6	28.5	27.6
10-12	16.3	7.9	9.2	12.7	14.4	8.7	7.1	6.2	3.7	7.0
≥13	2.1	3.8	1.9	4.9	2.5	1.4	1.8	0.8	0.7	0.2
N=	282	341	207	307	827	504	719	386	400	416

≤2	1.8	3.0	1.5	2.6	2.8	5.4	5.5	4.9	7.6	8.6
3-4	12.6	12.4	8.6	11.5	14.4	21.3	21.1	23.0	22.5	27.1
5-6	26.5	21.1	23.8	23.0	27.3	31.5	30.3	29.0	31.7	31.7
7-9	36.3	37.2	39.4	39.3	40.1	34.5	34.7	33.9	31.3	28.0
10-12	17.5	21.1	20.3	18.2	11.6	6.0	7.1	7.1	6.3	4.0
≥13	5.4	5.0	6.4	5.4	3.8	1.4	1.3	2.2	0.6	0.6
N=	223	298	823	809	319	653	380	183	489	350

15° 15°

≤2	2.9	1.7	2.0	4.5	5.1	6.1	5.0	7.4	9.1	5.6
3-4	8.8	8.0	8.1	9.0	17.8	22.3	21.9	24.7	26.2	23.5
5-6	12.6	15.1	21.8	26.7	28.4	29.9	30.5	28.7	31.2	34.6
7-9	37.2	37.5	43.6	40.4	37.1	33.0	33.1	34.5	28.9	29.0
10-12	25.5	27.6	19.4	16.6	9.5	7.3	7.9	4.4	3.9	6.8
≥13	13.0	10.1	5.1	2.8	2.2	1.4	1.5	0.3	0.6	0.6
N=	239	848	651	356	275	782	456	296	484	162

≤2	1.4	2.1	4.6	4.3	6.1	7.5	6.2	5.7	9.0	12.4
3-4	4.7	8.6	7.3	16.3	17.9	19.4	20.9	27.1	30.4	33.3
5-6	13.1	15.5	23.4	24.3	29.1	29.1	32.7	33.4	30.4	26.7
7-9	41.5	40.5	40.6	38.9	34.9	37.4	30.4	27.7	24.2	24.1
10-12	26.1	25.1	19.2	13.6	9.8	4.1	8.2	5.5	5.2	3.5
≥13	13.3	8.2	5.0	2.7	2.3	2.4	1.6	0.6	0.7	0.0
N=	731	291	261	301	347	532	306	494	401	315

≤2	2.2	5.8	5.5	6.3	7.3	6.4	9.2	7.9	11.1	15.9
3-4	7.4	8.4	16.5	18.0	25.0	25.7	23.1	33.6	36.4	35.6
5-6	19.7	22.7	24.0	25.0	26.2	31.4	33.0	25.0	22.8	28.1
7-9	35.8	42.9	36.5	37.1	34.2	29.2	27.7	28.9	25.3	16.9
10-12	25.8	15.9	13.5	8.9	5.7	5.9	5.9	4.6	3.7	3.0
≥13	9.2	4.2	4.0	4.7	1.6	1.5	1.0	0.0	0.6	0.4
N=	229	308	400	428	669	408	303	152	162	508

≤2	3.6	5.7	0.0	12.5	14.1	13.2	13.7	15.8	23.0	27.5
3-4	11.2	13.9	50.0	8.9	40.8	39.5	33.8	32.9	32.9	40.9
5-6	21.9	22.8	50.0	35.7	22.5	23.7	28.9	28.4	24.8	19.2
7-9	37.7	41.8	0.0	33.9	15.5	15.8	19.1	20.3	18.5	11.3
10-12	19.9	13.3	0.0	5.4	4.2	5.3	3.9	2.7	0.6	0.7
≥13	5.8	2.5	0.0	3.6	2.8	2.6	0.5	0.0	0.0	0.3
N=	448	158	2	56	71	38	204	222	161	291

N

≤2	0.0			16.7			41.7	27.3	42.9	35.7
3-4	0.0			16.7			16.7	30.3	37.1	42.9
5-6	0.0			16.7			8.3	33.3	8.6	14.3
7-9	50.0			33.3			33.3	6.1	8.6	7.1
10-12	50.0			16.7			0.0	3.0	0.0	0.0
≥13	0.0			0.0			0.0	0.0	2.9	0.0
N=	4			6			12	33	35	56

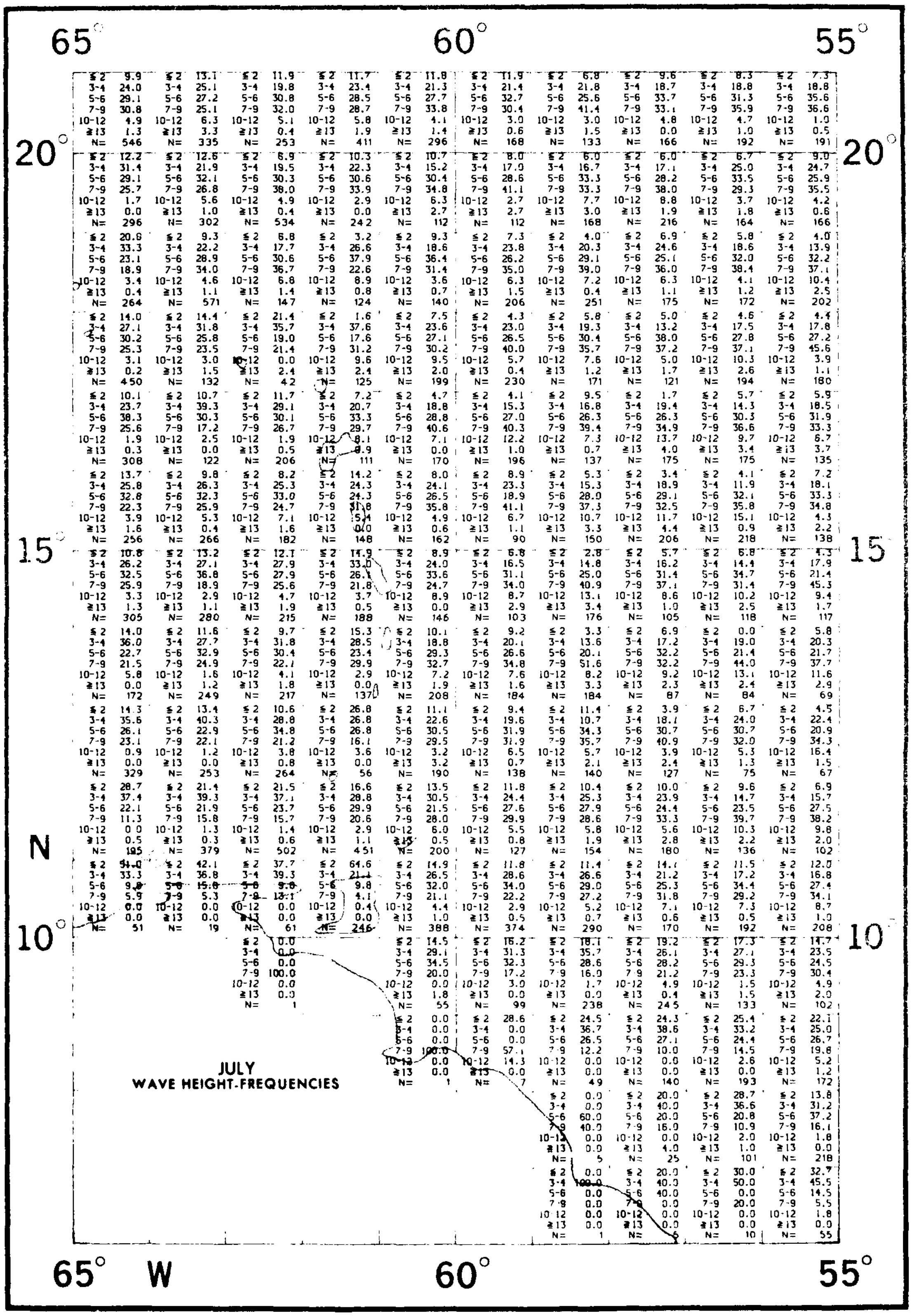
10° 10°

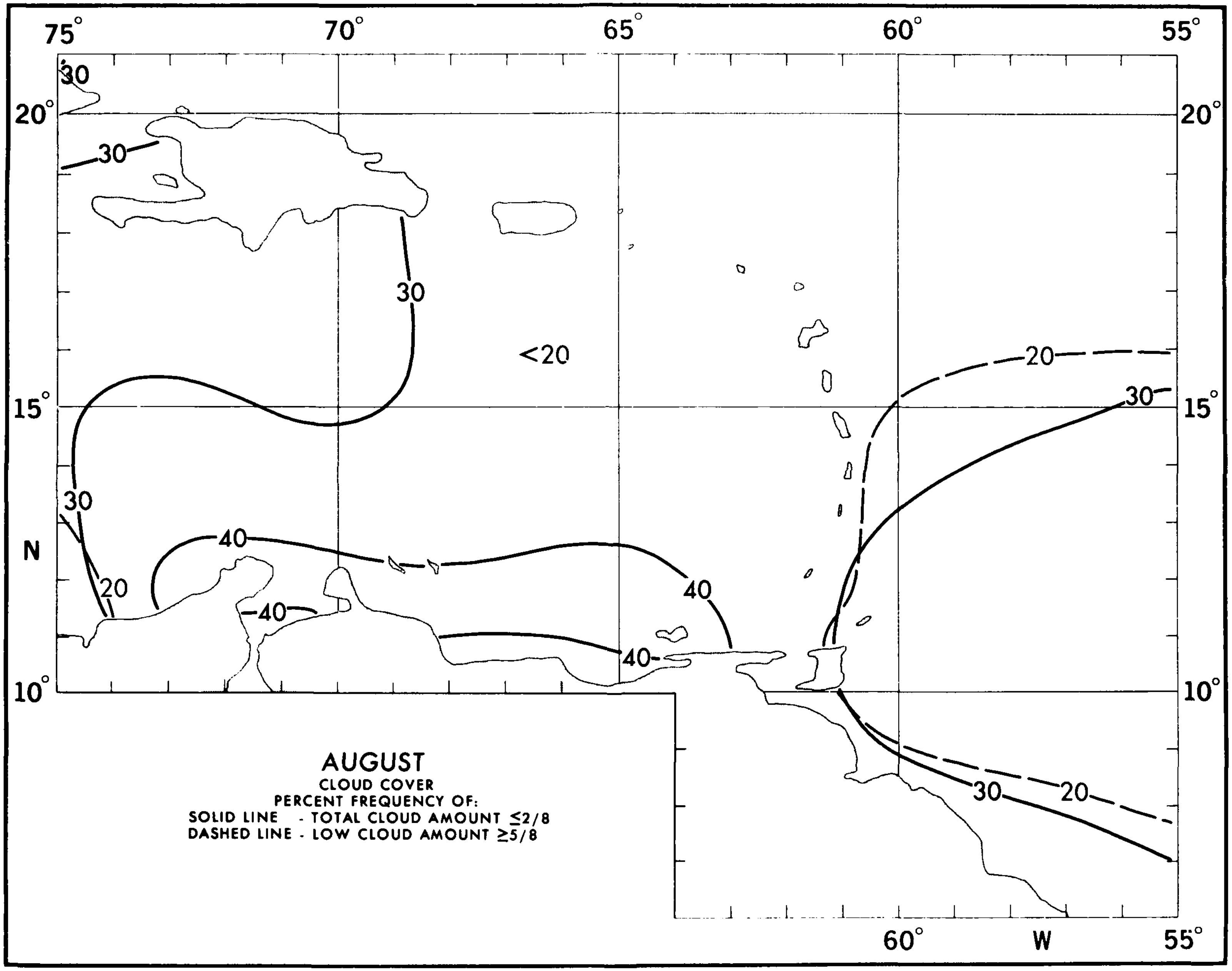
JULY
WAVE HEIGHT-FREQUENCIES

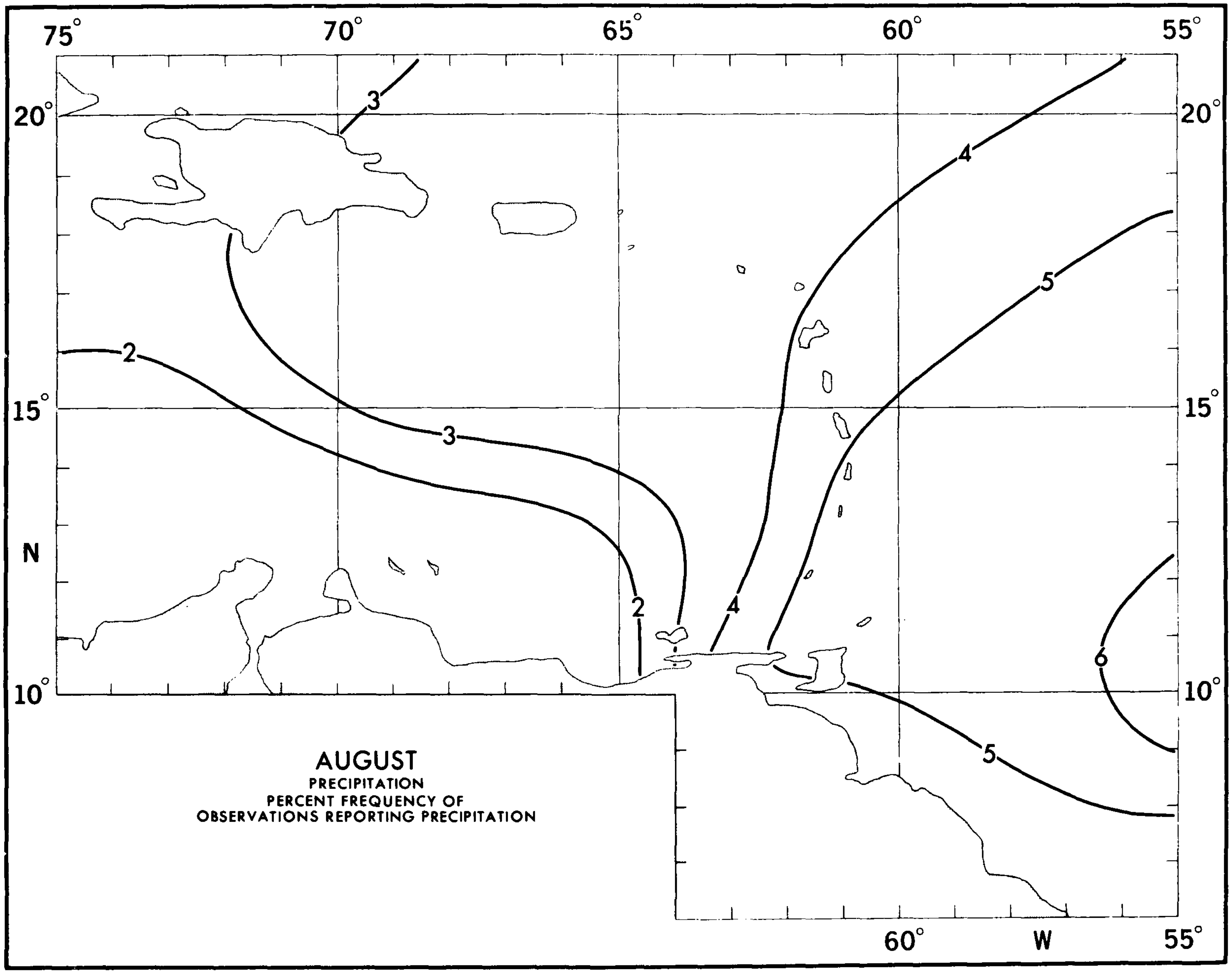
≤2	10.0	PERCENT FREQUENCY OF
3-4	20.0	VARIOUS RANGES WITHIN ONE-
5-6	30.0	DEGREE QUADRANGLES.
7-9	20.0	EXAMPLE:
10-12	10.0	30.0% OF ALL OBSERVED WAVE
≥13	10.0	HEIGHTS WERE IN THE RANGE 5
N =	1363	TO 6 FEET.

N = OBSERVATION COUNT.
WAVE DATA FOR THESE TABLES WERE SELECTED FROM THE HIGHER OF SEA OR SWELL WHEN BOTH WERE REPORTED.

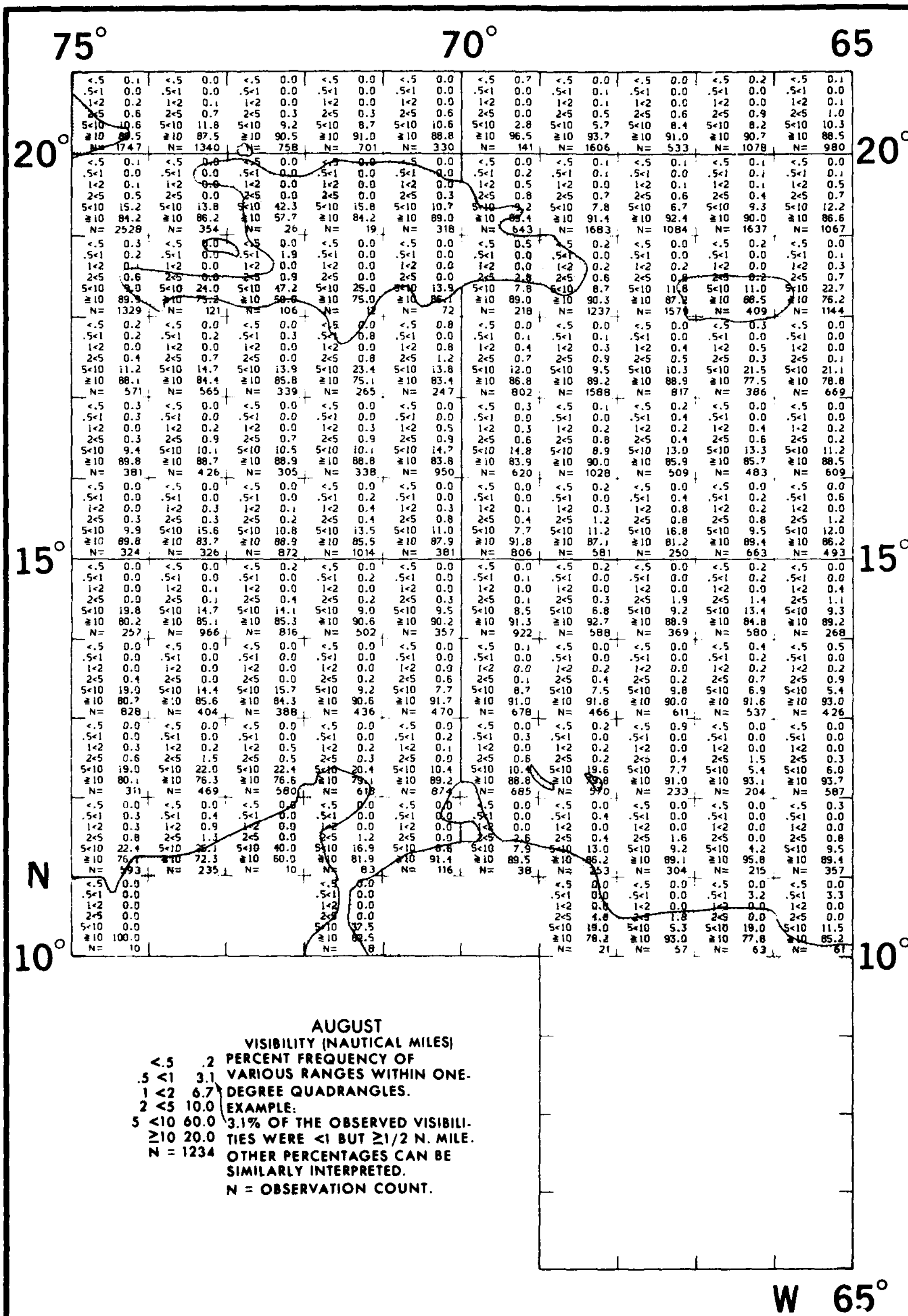
W 65°


65°
60°
55°
20°
15°
10°
N
65° W
60°
55°
JULY
WAVE HEIGHT-FREQUENCIES


AUGUST
CLOUD COVER
PERCENT FREQUENCY OF:
SOLID LINE - TOTAL CLOUD AMOUNT ≤2/8
DASHED LINE - LOW CLOUD AMOUNT ≥5/8
75° 70° 65° 60° 55°
20° 15° 10°
N
W
<20
30
40
20



AUGUST
PRECIPITATION
PERCENT FREQUENCY OF
OBSERVATIONS REPORTING PRECIPITATION



AUGUST

VISIBILITY (NAUTICAL MILES)

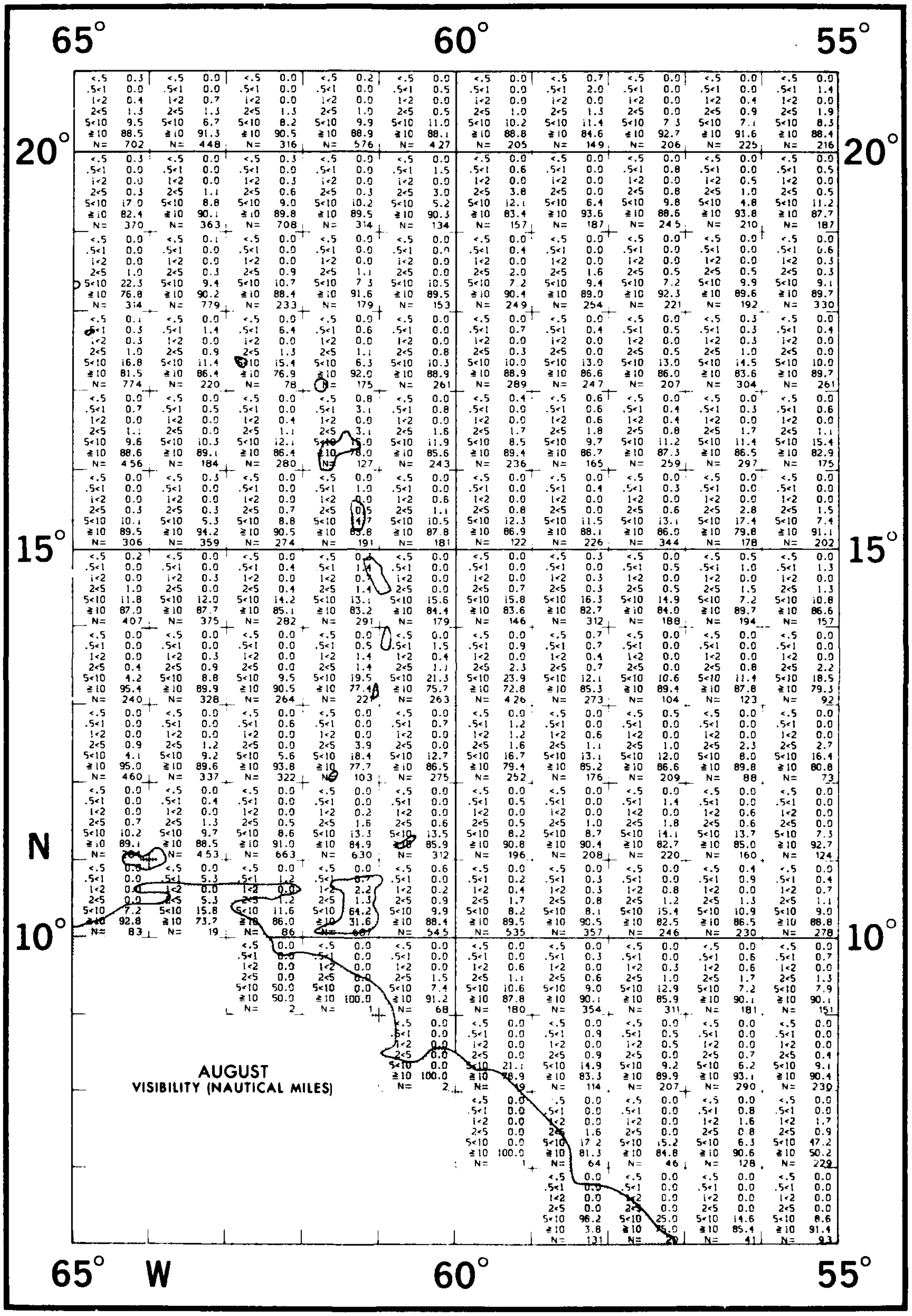
<.5	.2
.5 <1	3.1
1 <2	6.7
2 <5	10.0
5 <10	60.0
≥10	20.0
N =	1234

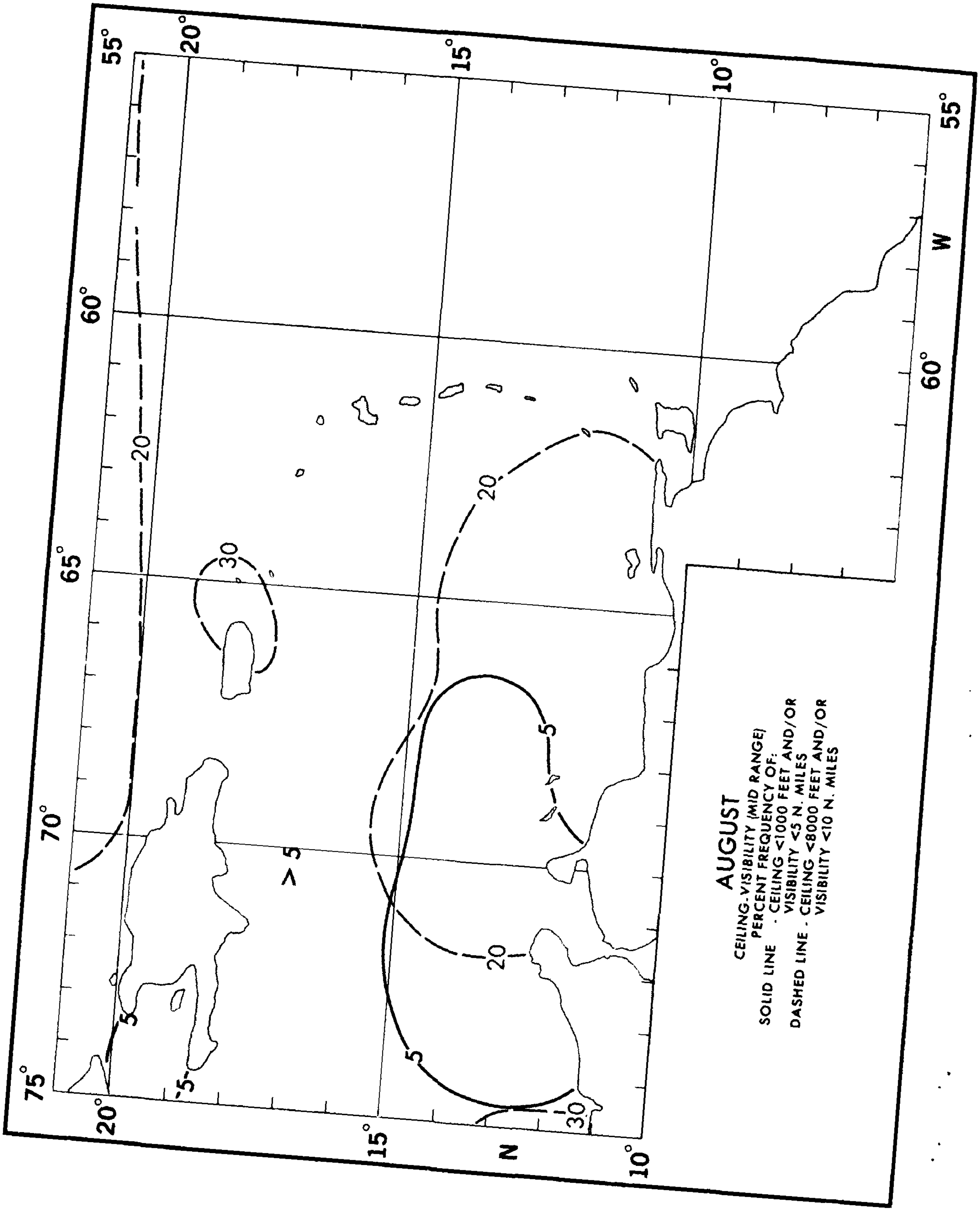
PERCENT FREQUENCY OF VARIOUS RANGES WITHIN ONE-DEGREE QUADRANGLES.

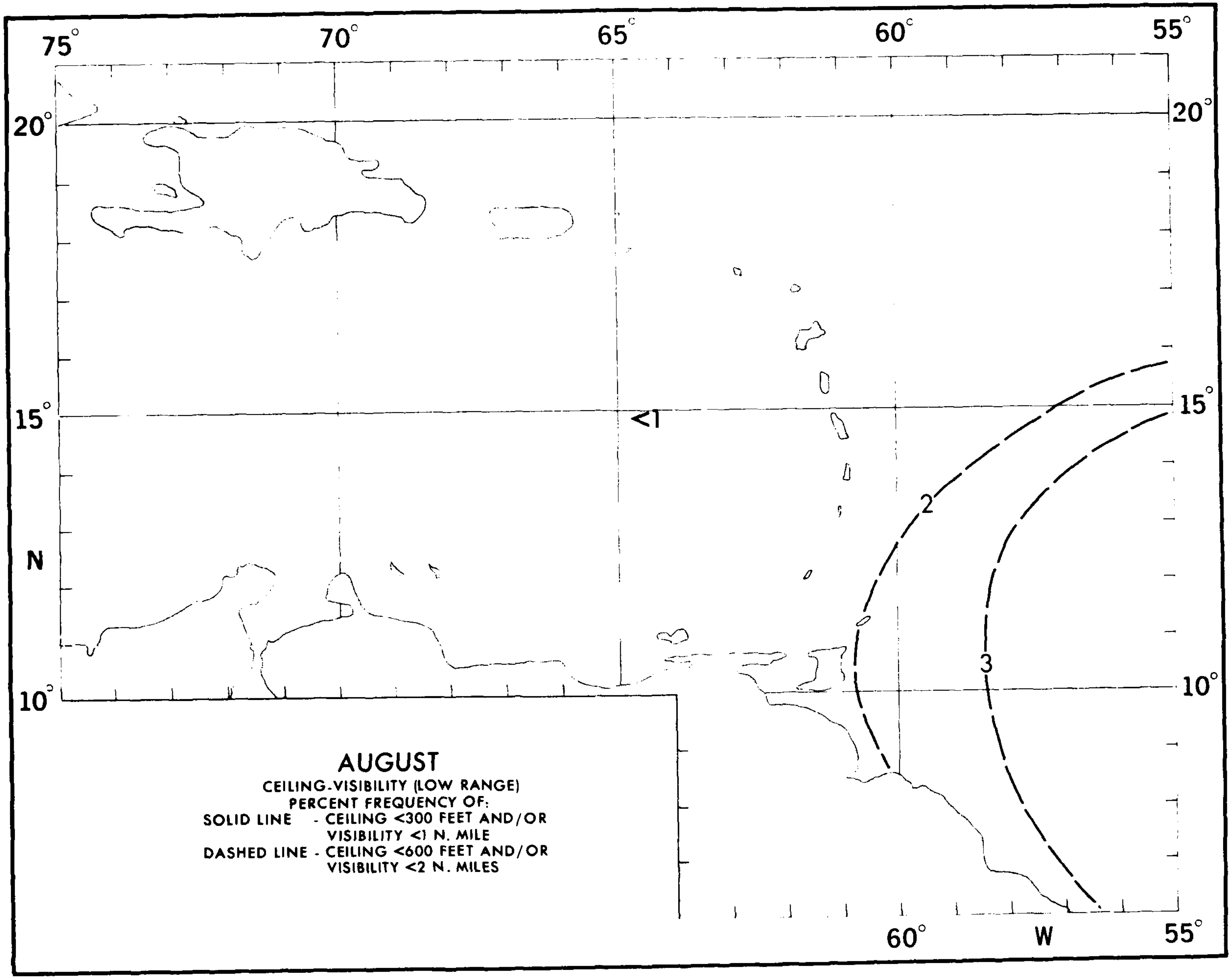
EXAMPLE:

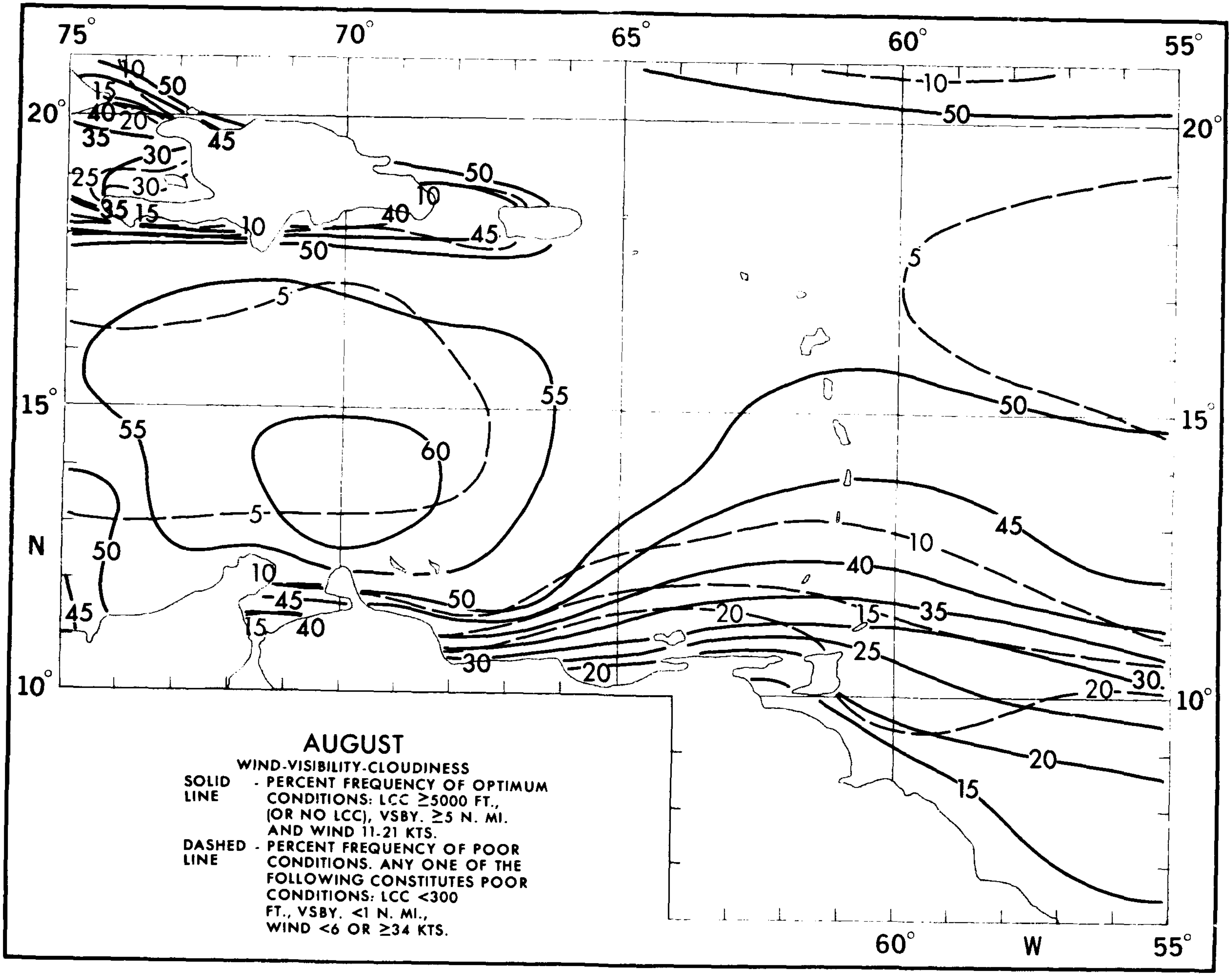
3.1% OF THE OBSERVED VISIBILITIES WERE <1 BUT ≥1/2 N. MILE. OTHER PERCENTAGES CAN BE SIMILARLY INTERPRETED.

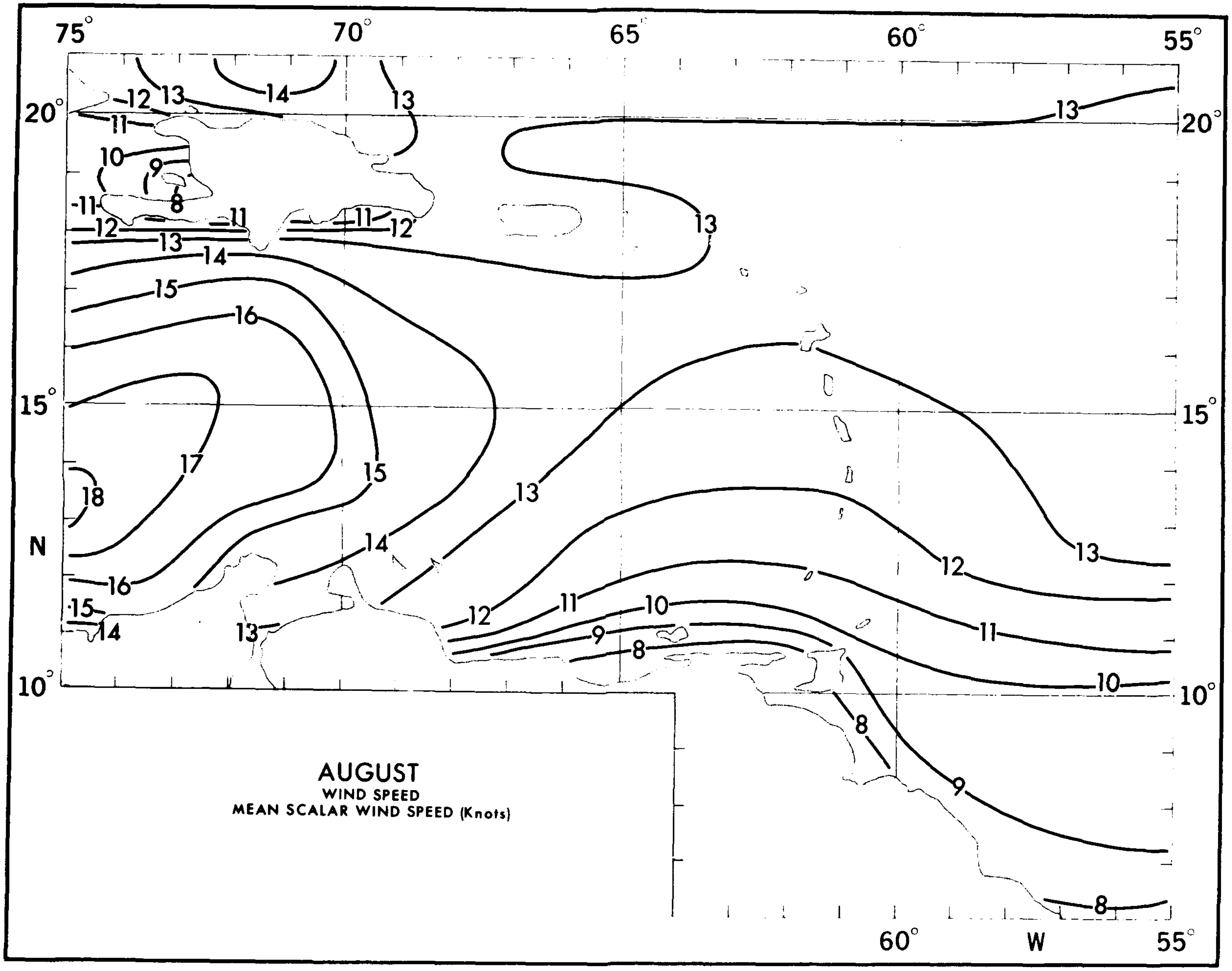
N = OBSERVATION COUNT.


65°
60°
55°
20°
15°
N
10°
AUGUST
VISIBILITY (NAUTICAL MILES)
65° W
60°
55°

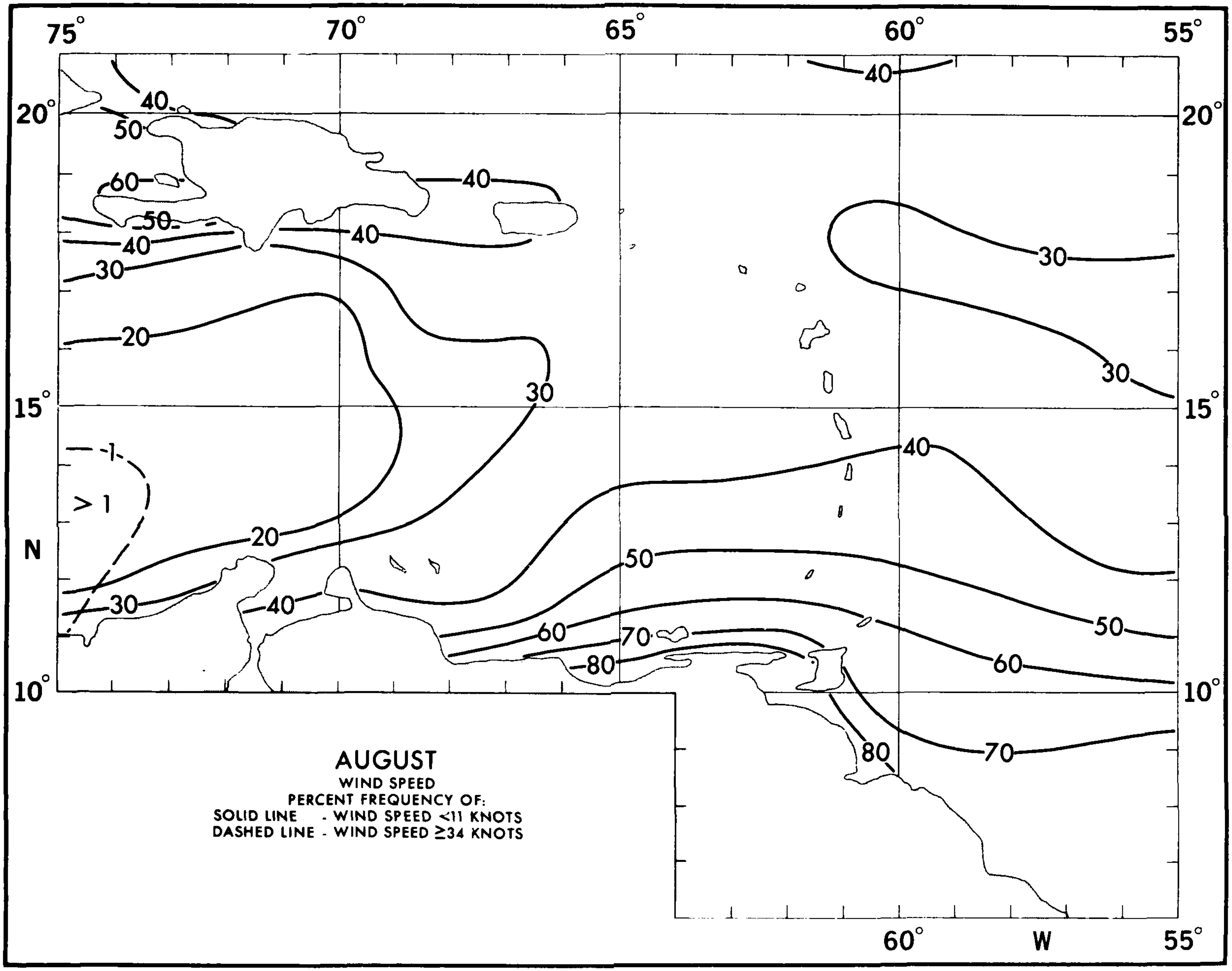

AUGUST
CEILING-VISIBILITY (MID RANGE)
PERCENT FREQUENCY OF:
SOLID LINE · CEILING <1000 FEET AND/OR
VISIBILITY <5 N. MILES
DASHED LINE · CEILING <8000 FEET AND/OR
VISIBILITY <10 N. MILES
75°
70°
65°
60°
55°
20°
15°
10°
N
W
20
30
5
> 5


75°
70°
65°
60°
55°
20°
15°
10°
N
W
<1
2
3
AUGUST
CEILING-VISIBILITY (LOW RANGE)
PERCENT FREQUENCY OF:
SOLID LINE - CEILING <300 FEET AND/OR VISIBILITY <1 N. MILE
DASHED LINE - CEILING <600 FEET AND/OR VISIBILITY <2 N. MILES

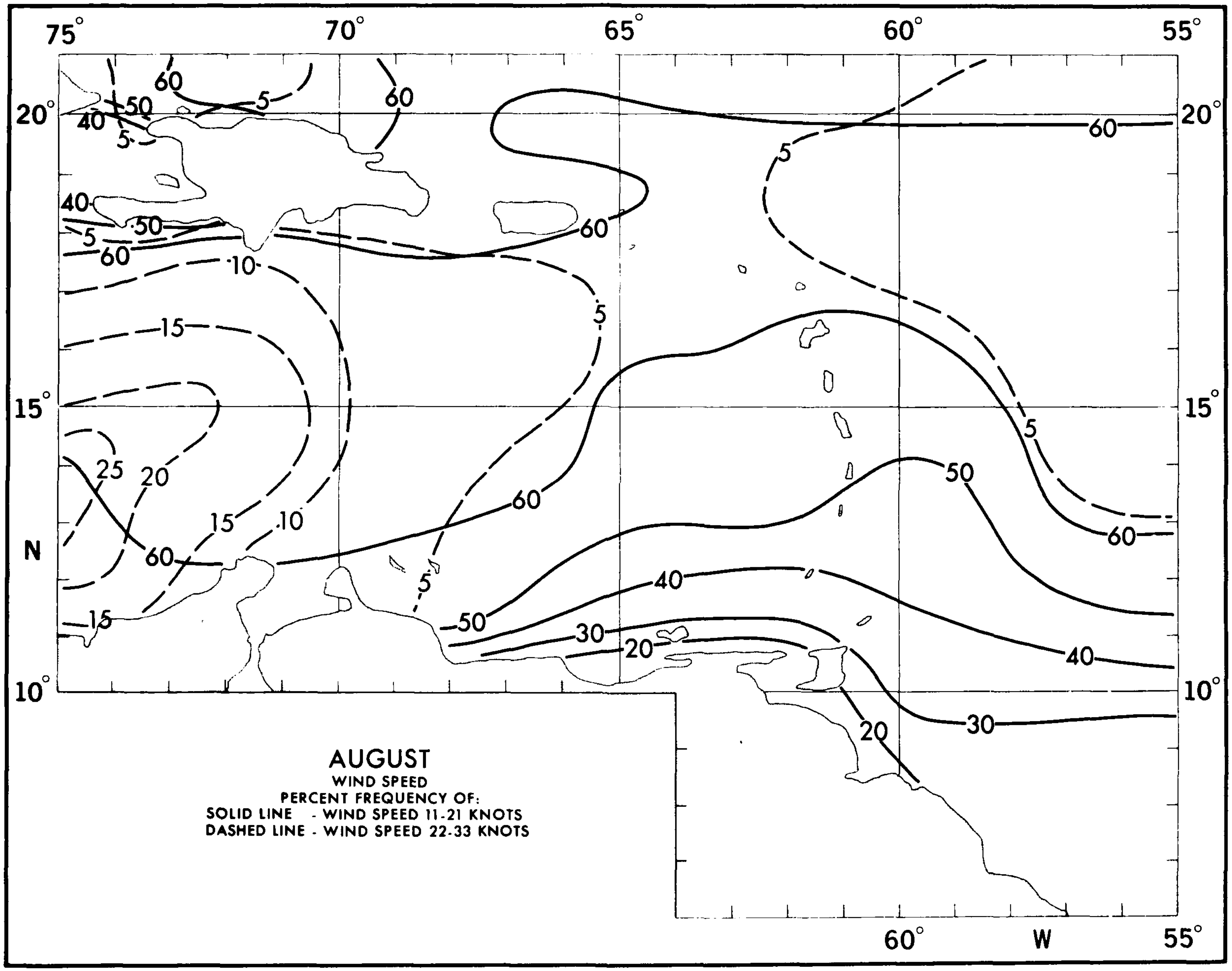

AUGUST
WIND-VISIBILITY-CLOUDINESS
SOLID LINE - PERCENT FREQUENCY OF OPTIMUM CONDITIONS: LCC ≥5000 FT., (OR NO LCC), VSBY. ≥5 N. MI. AND WIND 11-21 KTS.
DASHED LINE - PERCENT FREQUENCY OF POOR CONDITIONS. ANY ONE OF THE FOLLOWING CONSTITUTES POOR CONDITIONS: LCC <300 FT., VSBY. <1 N. MI., WIND <6 OR ≥34 KTS.
75°
70°
65°
60°
55°
20°
15°
10°
N
W



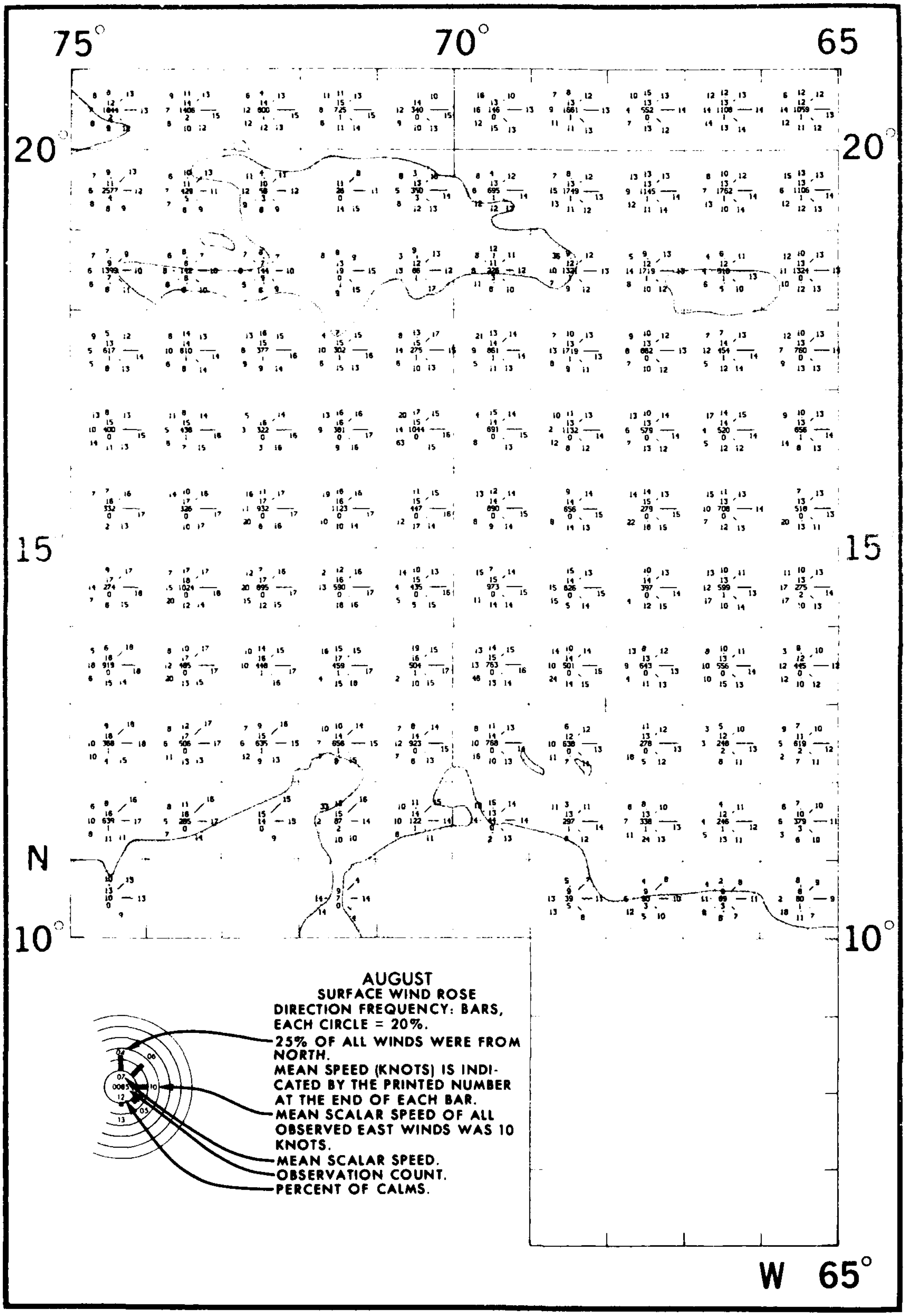
AUGUST
WIND SPEED
MEAN SCALAR WIND SPEED (Knots)

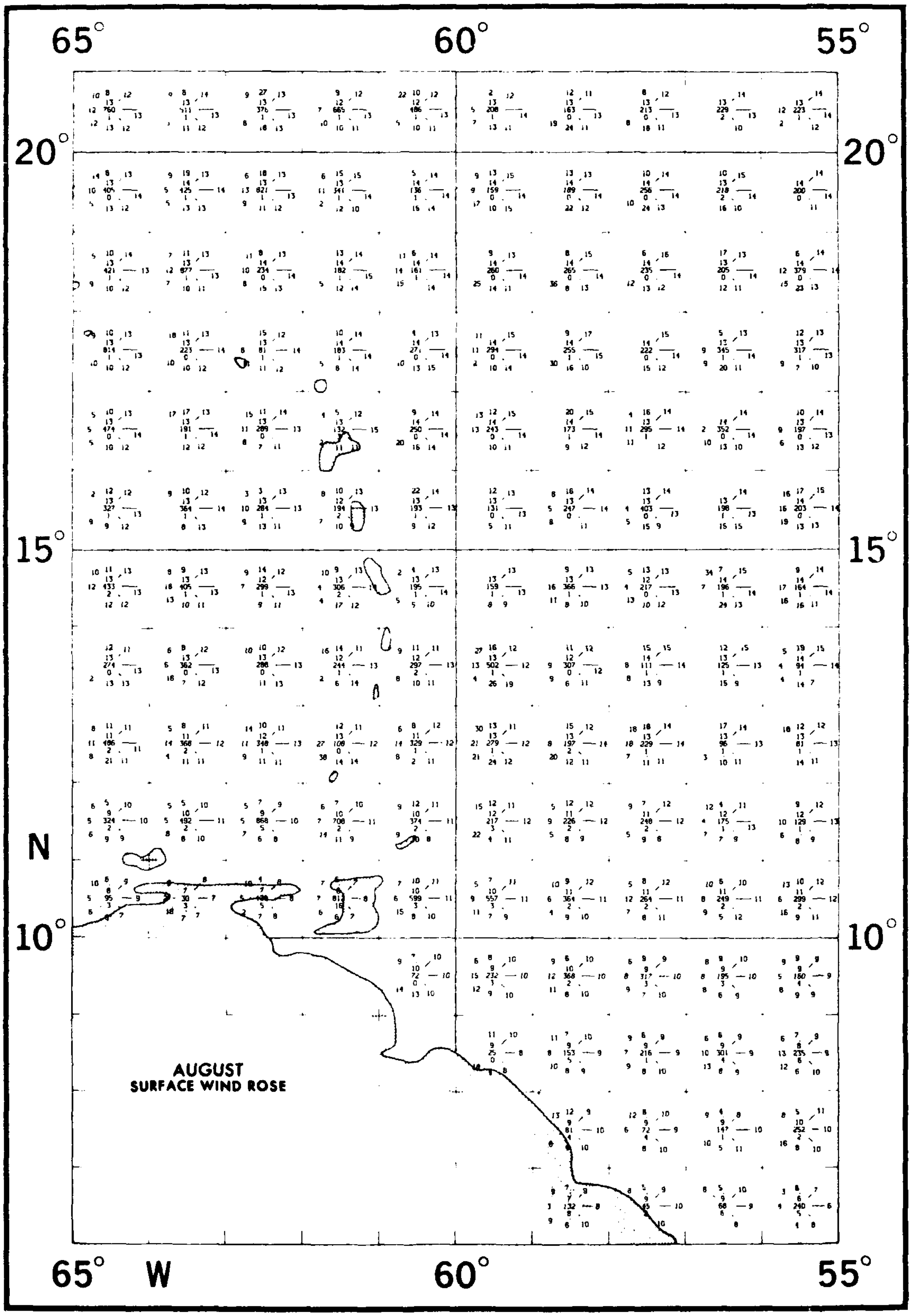


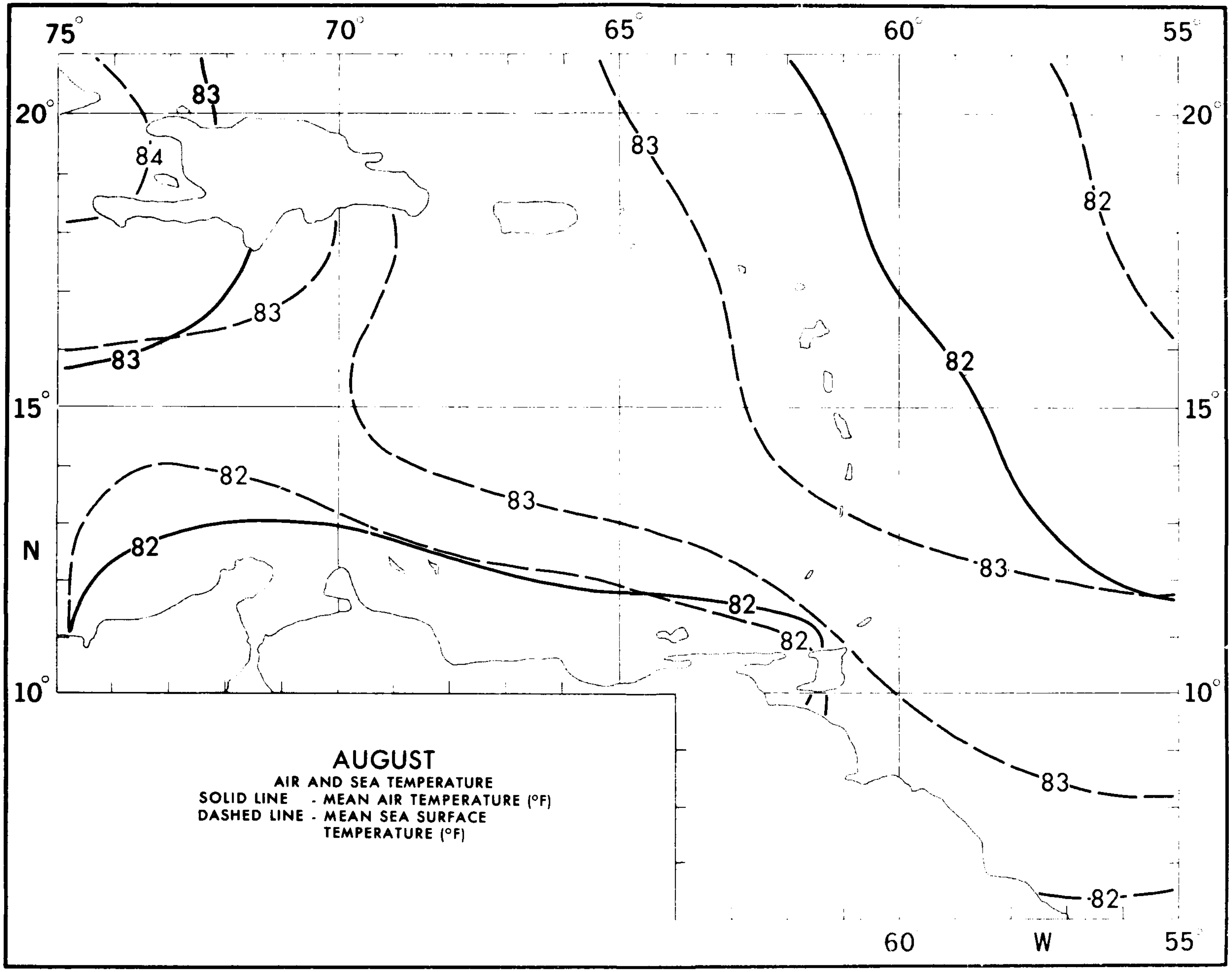
AUGUST
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE - WIND SPEED <11 KNOTS
DASHED LINE - WIND SPEED ≥34 KNOTS

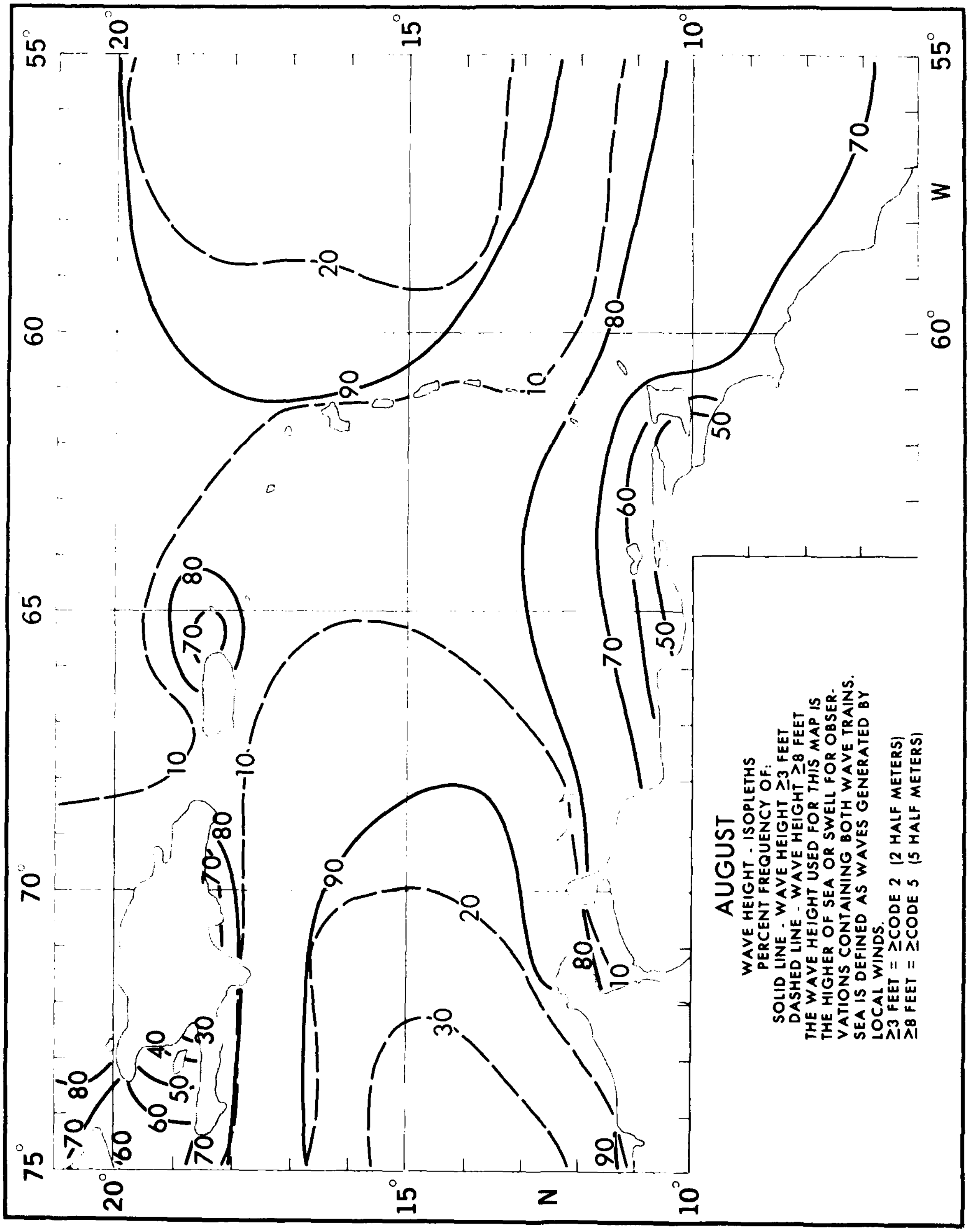


AUGUST
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE - WIND SPEED 11-21 KNOTS
DASHED LINE - WIND SPEED 22-33 KNOTS


75°
70°
65
20°
15
N
10°
AUGUST
SURFACE WIND ROSE
DIRECTION FREQUENCY: BARS, EACH CIRCLE = 20%.
25% OF ALL WINDS WERE FROM NORTH.
MEAN SPEED (KNOTS) IS INDICATED BY THE PRINTED NUMBER AT THE END OF EACH BAR.
MEAN SCALAR SPEED OF ALL OBSERVED EAST WINDS WAS 10 KNOTS.
MEAN SCALAR SPEED.
OBSERVATION COUNT.
PERCENT OF CALMS.
W 65°


65°
60°
55°
20°
15°
10°
N
W
AUGUST
SURFACE WIND ROSE


AUGUST
AIR AND SEA TEMPERATURE
SOLID LINE - MEAN AIR TEMPERATURE (°F)
DASHED LINE - MEAN SEA SURFACE TEMPERATURE (°F)
75°
70°
65°
60°
55°
20°
15°
10°
N
W
82
83
84


AUGUST
WAVE HEIGHT - ISOPLETHS
PERCENT FREQUENCY OF:
SOLID LINE - WAVE HEIGHT ≥3 FEET
DASHED LINE - WAVE HEIGHT ≥8 FEET
THE WAVE HEIGHT USED FOR THIS MAP IS
THE HIGHER OF SEA OR SWELL FOR OBSER-
VATIONS CONTAINING BOTH WAVE TRAINS.
SEA IS DEFINED AS WAVES GENERATED BY
LOCAL WINDS.
≥3 FEET = ≥CODE 2 (2 HALF METERS)
≥8 FEET = ≥CODE 5 (5 HALF METERS)
75°
70°
65
60
55°
20°
15°
10°
N
W

75° 70° 65

≤2	27.0	17.7	16.5	14.8	19.0	11.2	16.2	17.7	12.0	12.3
3-4	34.2	34.6	31.1	30.7	32.0	31.9	33.3	26.2	29.0	28.1
5-6	23.1	25.2	28.8	29.9	25.0	25.9	26.5	29.8	30.0	28.1
7-9	13.4	19.1	20.6	21.4	21.1	29.3	19.9	21.1	23.6	25.1
10-12	1.9	3.1	2.4	2.8	2.8	0.9	3.1	4.5	4.5	5.2
≥13	0.4	0.4	0.6	0.5	0.0	0.9	1.0	0.7	1.0	1.2
N=	1342	1125	671	613	284	116	1366	446	938	754

20° 20°

≤2	36.7	42.3	20.0	7.7	18.3	15.4	15.6	10.5	12.6	18.7
3-4	34.9	30.5	30.0	46.2	33.9	32.8	33.4	28.3	27.3	36.8
5-6	15.7	14.3	10.0	23.1	27.3	29.8	30.6	32.6	30.4	24.0
7-9	9.7	10.7	40.0	23.1	18.7	20.1	17.4	23.8	25.2	16.7
10-12	2.5	1.8	0.0	0.0	1.4	1.7	2.6	3.5	3.2	3.0
≥13	0.5	0.4	0.0	0.0	0.3	0.2	0.3	1.3	1.3	0.8
N=	1936	272	10	13	289	597	1439	913	1288	845
≤2	33.0	56.7	73.9	33.3	21.6	53.4	18.8	15.4	19.5	40.0
3-4	32.5	17.3	19.6	22.2	33.3	25.9	31.9	33.7	36.0	39.8
5-6	19.8	13.3	2.2	11.1	27.5	14.0	28.3	26.6	26.0	12.3
7-9	13.5	9.3	4.3	22.2	13.7	6.2	17.8	20.9	15.6	6.5
10-12	1.2	1.3	0.0	0.0	3.9	0.0	2.5	2.7	2.4	0.9
≥13	0.0	0.0	0.0	11.1	0.0	0.5	0.8	0.8	0.6	0.5
N=	961	75	46	9	51	193	1045	1302	339	912
≤2	11.5	17.3	10.9	11.9	15.6	9.1	14.8	15.8	16.2	19.5
3-4	22.6	21.8	19.9	19.2	22.1	28.0	30.3	34.8	33.8	46.7
5-6	29.5	27.2	31.6	30.1	24.6	29.1	28.0	28.2	24.1	18.4
7-9	29.7	26.0	30.5	31.6	30.7	25.5	22.7	17.5	18.9	11.3
10-12	5.1	6.6	6.8	4.7	4.0	5.7	3.5	3.1	4.6	2.9
≥13	1.6	1.2	0.4	2.6	3.0	2.7	0.8	0.6	2.4	1.3
N=	451	427	266	193	199	671	1302	670	328	550
≤2	6.8	9.6	8.7	2.4	5.2	7.3	12.6	14.5	9.3	13.9
3-4	25.2	21.7	23.3	15.6	17.5	24.8	30.5	30.4	35.0	31.5
5-6	31.3	26.6	26.2	25.3	29.7	31.1	29.5	28.4	25.7	30.1
7-9	26.5	35.2	32.5	43.6	35.9	29.5	23.2	21.3	26.4	19.4
10-12	8.7	5.2	7.5	11.4	9.7	6.1	3.3	4.2	2.4	3.0
≥13	1.6	1.6	1.7	1.7	2.0	1.2	1.0	1.2	1.2	2.1
N=	310	364	240	289	794	492	794	408	409	438
≤2	6.2	4.9	4.7	3.9	7.1	10.4	10.7	11.9	13.7	10.3
3-4	16.5	16.6	15.2	18.8	20.0	27.9	24.9	21.3	28.8	31.6
5-6	27.7	29.7	25.4	30.5	27.7	29.6	32.2	28.7	27.0	31.3
7-9	33.1	33.9	40.3	34.7	34.2	26.3	26.9	29.7	25.3	21.2
10-12	15.4	11.3	13.0	9.9	9.5	5.1	3.7	5.4	4.2	3.8
≥13	1.2	3.5	1.3	2.1	1.5	0.8	1.6	3.0	1.0	1.8
N=	260	283	744	849	325	666	438	202	525	339

15° 15°

≤2	3.9	4.8	3.7	5.0	4.9	9.3	8.9	10.9	16.0	10.0
3-4	14.7	15.0	16.3	18.2	21.3	27.2	27.8	33.0	33.7	28.7
5-6	27.5	21.2	26.5	26.9	27.2	32.5	30.4	26.3	28.6	32.5
7-9	41.2	39.1	37.3	37.3	36.9	25.9	28.9	21.1	19.1	23.0
10-12	10.8	16.3	13.2	10.9	8.0	3.9	3.7	6.0	1.7	5.7
≥13	2.0	3.6	3.0	1.7	1.7	1.2	0.4	2.8	1.0	0.0
N=	204	811	710	402	287	765	461	285	419	209
≤2	2.8	3.8	6.0	9.8	7.4	8.3	10.6	11.5	13.4	19.6
3-4	13.9	17.2	17.2	19.5	22.5	25.8	27.1	27.9	31.8	34.9
5-6	21.7	21.8	26.6	25.3	29.4	32.3	30.2	34.7	29.6	31.5
7-9	39.3	37.5	35.1	34.3	31.0	27.1	25.7	20.9	20.9	11.1
10-12	18.7	14.8	13.8	10.0	7.9	5.5	5.8	3.8	3.3	1.7
≥13	3.6	4.9	1.3	1.1	1.9	1.1	0.5	1.1	0.9	1.1
N=	674	344	319	379	378	532	377	444	449	352
≤2	2.5	5.8	9.6	10.3	19.4	14.1	10.3	14.8	12.7	26.5
3-4	13.3	16.9	24.7	20.8	25.2	27.7	26.6	28.4	33.8	34.0
5-6	23.3	25.9	28.1	33.3	27.8	28.2	34.1	32.9	28.7	26.1
7-9	41.7	39.0	28.8	29.4	22.5	24.6	24.7	20.6	20.4	11.3
10-12	14.2	9.3	7.8	4.8	3.7	4.9	2.5	3.2	3.2	2.0
≥13	5.0	3.2	1.0	1.4	1.4	1.0	1.9	0.0	1.3	0.2
N=	240	344	385	418	648	419	320	155	157	506
≤2	9.4	9.8	0.0	19.7	23.2	16.7	21.9	20.9	26.9	36.7
3-4	17.2	22.0	50.0	24.2	33.7	43.3	33.8	35.5	36.8	36.0
5-6	25.8	18.9	0.0	21.2	16.8	23.3	24.4	24.4	22.8	19.8
7-9	33.2	34.1	0.0	28.8	23.2	13.3	18.9	17.1	11.7	7.6
10-12	10.4	12.9	0.0	4.5	3.2	0.0	0.5	2.1	1.2	0.0
≥13	3.9	2.3	50.0	1.5	0.0	3.3	0.5	0.0	0.6	0.0
N=	783	132	2	66	95	30	201	234	171	278

N

≤2	50.0			66.7			25.0	37.1	40.6	42.3
3-4	0.0			0.0			41.7	40.0	34.4	46.2
5-6	50.0			0.0			16.7	20.0	25.0	1.9
7-9	0.0			33.3			16.7	2.9	0.0	7.7
10-12	0.0			0.0			0.0	0.0	0.0	1.9
≥13	0.0			0.0			0.0	0.0	0.0	0.0
N=	6			6			12	35	32	52

10° 10°

AUGUST
WAVE HEIGHT-FREQUENCIES

≤2	10.0	PERCENT FREQUENCY OF
3-4	20.0	VARIOUS RANGES WITHIN ONE-
5-6	30.0	DEGREE QUADRANGLES.
7-9	20.0	EXAMPLE:
10-12	10.0	30.0% OF ALL OBSERVED WAVE
≥13	10.0	HEIGHTS WERE IN THE RANGE 5
N =	1363	TO 6 FEET.

N = OBSERVATION COUNT.
WAVE DATA FOR THESE TABLES WERE SELECTED FROM THE HIGHER OF SEA OR SWELL WHEN BOTH WERE REPORTED.

W 65°

65° 60° 55°

20°

≤2	14.6	12.5	12.2	14.6	17.9	10.8	10.3	13.5	10.5	11.5
3-4	28.2	28.4	30.0	22.7	23.2	26.3	21.4	18.8	20.5	25.9
5-6	28.7	31.8	26.6	31.4	28.5	28.7	34.2	35.3	26.8	27.6
7-9	22.3	22.3	27.0	26.2	23.5	24.0	29.1	27.6	36.3	24.1
10-12	5.0	4.7	2.7	3.7	6.0	7.2	2.6	2.4	4.7	9.8
≥13	1.2	0.3	1.5	1.5	0.9	3.0	2.6	2.4	1.1	1.1
N=	575	359	263	405	319	167	117	170	190	174

≤2	11.6	12.4	9.8	9.5	13.3	8.0	9.1	7.4	8.4	6.2
3-4	37.2	22.3	24.6	22.6	16.2	19.2	16.9	19.7	21.2	21.4
5-6	25.3	30.9	28.3	35.4	29.5	33.6	31.8	30.0	25.1	32.4
7-9	19.5	25.8	30.6	28.8	34.3	30.4	33.1	31.5	36.9	29.7
10-12	4.6	6.9	5.0	2.9	5.7	6.4	6.5	7.9	5.6	9.0
≥13	1.8	1.7	1.7	0.8	1.0	2.4	2.6	3.4	2.8	1.4
N=	328	291	520	243	105	125	154	203	179	145

≤2	29.1	12.0	8.5	11.0	5.3	13.9	6.5	8.3	6.9	8.6
3-4	23.6	30.0	28.2	24.7	29.3	18.3	18.0	22.3	27.5	23.2
5-6	26.7	30.8	28.2	26.0	25.6	27.4	27.6	32.1	31.9	31.8
7-9	17.4	24.0	26.6	28.8	35.3	35.1	35.5	28.0	25.6	28.6
10-12	3.1	1.7	6.2	6.8	3.8	3.8	8.3	8.3	6.3	6.4
≥13	0.0	1.4	2.3	2.7	0.8	1.4	4.1	1.0	1.9	1.4
N=	258	574	177	146	133	208	217	193	160	220

≤2	19.2	24.1	19.0	10.9	8.9	3.6	10.7	11.5	7.1	8.2
3-4	30.7	32.2	35.7	27.1	24.8	22.7	21.0	20.7	20.4	23.6
5-6	25.4	26.4	21.4	28.7	23.3	31.5	28.0	31.6	31.3	24.2
7-9	21.1	15.5	21.4	24.8	35.6	31.5	36.4	29.3	32.7	33.5
10-12	2.1	1.1	2.4	4.7	5.9	7.2	2.8	5.2	6.2	9.9
≥13	1.4	0.6	0.0	3.9	1.5	3.6	0.9	1.7	2.4	0.5
N=	563	174	42	129	202	251	214	174	211	182

≤2	15.9	20.4	16.9	14.9	6.1	8.2	7.0	11.2	7.4	8.3
3-4	35.1	28.0	32.4	23.4	20.9	27.9	28.7	25.0	27.6	26.3
5-6	29.5	32.5	31.6	26.6	28.6	27.3	28.7	26.1	29.6	24.8
7-9	17.5	17.8	13.3	28.7	37.2	31.7	29.5	27.1	29.6	31.6
10-12	0.8	1.3	3.6	2.1	4.6	4.4	5.4	8.0	3.4	6.8
≥13	1.1	0.0	2.2	4.3	2.6	0.5	0.8	2.7	2.5	2.3
N=	359	157	225	94	196	183	129	188	203	133

≤2	13.0	15.7	15.1	24.0	11.5	9.8	9.4	7.8	8.4	5.5
3-4	34.0	35.1	34.9	30.5	24.3	17.4	23.9	28.0	26.1	20.7
5-6	29.2	28.8	27.2	25.3	31.1	30.4	29.6	28.4	27.7	29.0
7-9	20.2	15.7	18.5	14.9	28.4	31.5	28.3	25.2	28.6	33.1
10-12	3.2	3.0	3.4	4.5	4.1	8.7	5.7	9.2	5.9	9.7
≥13	0.4	1.7	0.9	0.6	0.7	2.2	3.1	1.4	3.4	2.1
N=	253	299	232	154	148	92	159	218	119	145

15° 15°

≤2	16.0	15.5	12.1	23.1	9.5	9.3	9.5	12.5	6.7	11.0
3-4	31.4	34.4	44.2	32.4	26.3	21.6	24.2	24.1	29.1	18.9
5-6	31.1	32.0	22.3	24.4	37.2	25.8	28.4	27.7	26.1	29.9
7-9	18.7	14.1	19.1	15.6	24.1	29.9	29.5	23.2	27.6	30.7
10-12	2.4	4.1	2.3	3.1	2.9	8.2	7.9	10.7	8.2	8.7
≥13	0.3	0.0	0.0	1.3	0.0	5.2	0.5	1.8	2.2	0.8
N=	331	291	215	225	137	97	190	112	134	127

≤2	11.5	20.4	17.6	18.5	13.8	17.2	7.9	6.9	6.5	6.5
3-4	29.7	33.0	38.5	28.6	28.2	22.1	13.2	23.6	24.1	24.2
5-6	37.0	28.9	29.4	32.1	33.1	22.5	33.3	40.3	29.6	32.3
7-9	19.8	14.8	11.3	15.5	17.7	28.6	36.0	23.6	33.3	27.4
10-12	2.1	2.6	3.2	3.0	3.3	7.6	7.4	4.2	6.5	9.7
≥13	0.0	0.4	0.0	2.4	3.9	1.9	2.1	1.4	0.0	0.0
N=	192	270	221	168	181	262	189	72	108	62

≤2	22.4	23.4	21.8	16.7	13.4	18.0	21.3	11.2	8.7	6.7
3-4	34.9	37.1	35.4	48.6	27.6	26.9	22.8	29.6	26.1	31.7
5-6	25.0	24.7	24.6	19.4	31.3	32.9	28.7	30.2	40.6	35.0
7-9	14.8	13.1	15.1	11.1	21.7	15.6	23.5	24.9	18.8	20.0
10-12	2.9	1.7	2.8	4.2	4.6	5.4	3.7	2.4	5.8	5.0
≥13	0.0	0.0	0.4	0.0	1.4	1.2	0.0	1.8	0.0	1.7
N=	384	291	285	72	217	167	136	169	69	60

≤2	37.1	29.2	31.2	27.5	18.7	13.5	16.3	18.8	12.2	10.1
3-4	34.8	35.0	38.4	34.2	32.4	23.4	31.3	24.4	30.1	28.3
5-6	21.3	25.4	20.7	20.7	25.7	27.0	30.7	27.5	28.5	24.2
7-9	5.4	9.2	8.8	14.5	18.7	27.0	16.9	23.7	25.2	34.3
10-12	1.4	0.9	0.8	2.5	3.7	7.8	4.2	5.6	4.1	2.0
≥13	0.0	0.3	0.2	0.6	0.8	1.4	0.6	0.0	0.0	1.0
N=	221	346	523	488	241	141	166	160	123	99

N

≤2	50.6	46.2	47.4	55.5	22.5	25.5	22.9	25.1	21.2	15.7
3-4	30.0	38.5	29.8	24.1	31.9	32.0	29.6	29.1	34.5	31.0
5-6	8.6	7.7	19.3	13.1	25.8	23.7	24.3	25.7	22.4	26.9
7-9	2.9	0.0	3.5	6.3	16.2	16.2	19.7	16.6	18.8	23.1
10-12	0.0	7.7	0.0	0.5	3.1	2.1	3.5	3.4	2.4	2.3
≥13	0.0	0.0	0.0	0.5	0.4	0.5	0.0	0.0	0.6	0.9
N=	70	13	57	191	445	431	284	175	165	216

10° 10°

≤2			0.0	100.0	16.1	25.2	29.7	31.1	22.5	27.2
3-4			100.0	0.0	43.5	28.2	32.2	31.5	27.2	35.1
5-6			0.0	0.0	25.8	22.9	22.4	19.5	29.1	14.9
7-9			0.0	0.0	8.1	19.1	11.5	12.9	16.6	21.1
10-12			0.0	0.0	6.5	4.6	3.8	4.1	3.3	1.8
≥13			0.0	0.0	0.0	0.0	0.3	0.8	1.3	0.0
N=			1	1	62	131	286	241	151	114

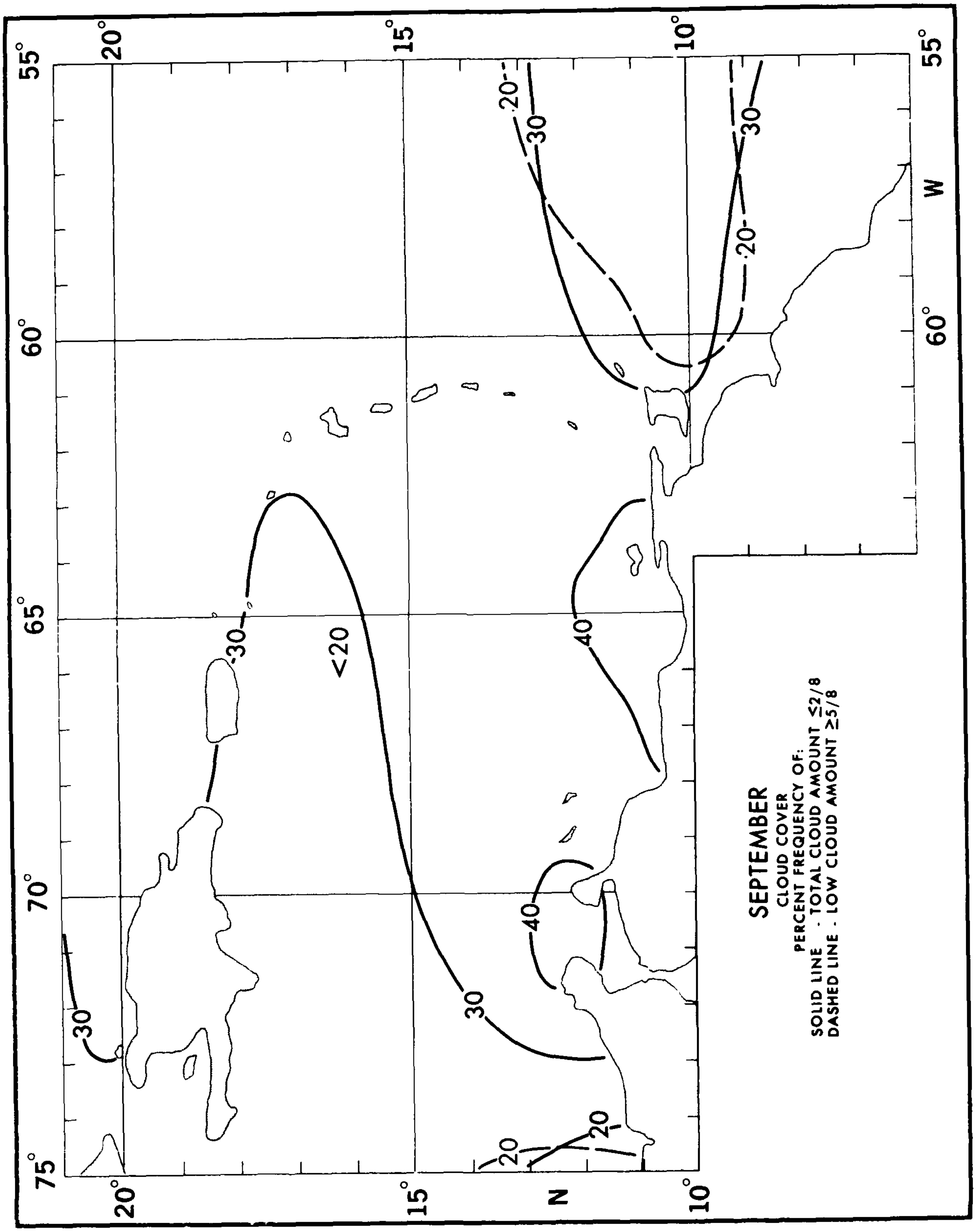
≤2					50.0	50.0	23.3	29.0	37.6	34.8
3-4					0.0	16.7	34.2	35.5	31.2	36.0
5-6					50.0	16.7	30.1	24.9	17.5	16.9
7-9					0.0	8.3	8.2	8.3	10.7	9.0
10-12					0.0	8.3	4.1	1.2	2.6	2.8
≥13					0.0	0.0	0.0	1.2	0.4	0.6
N=					2	12	73	169	234	178

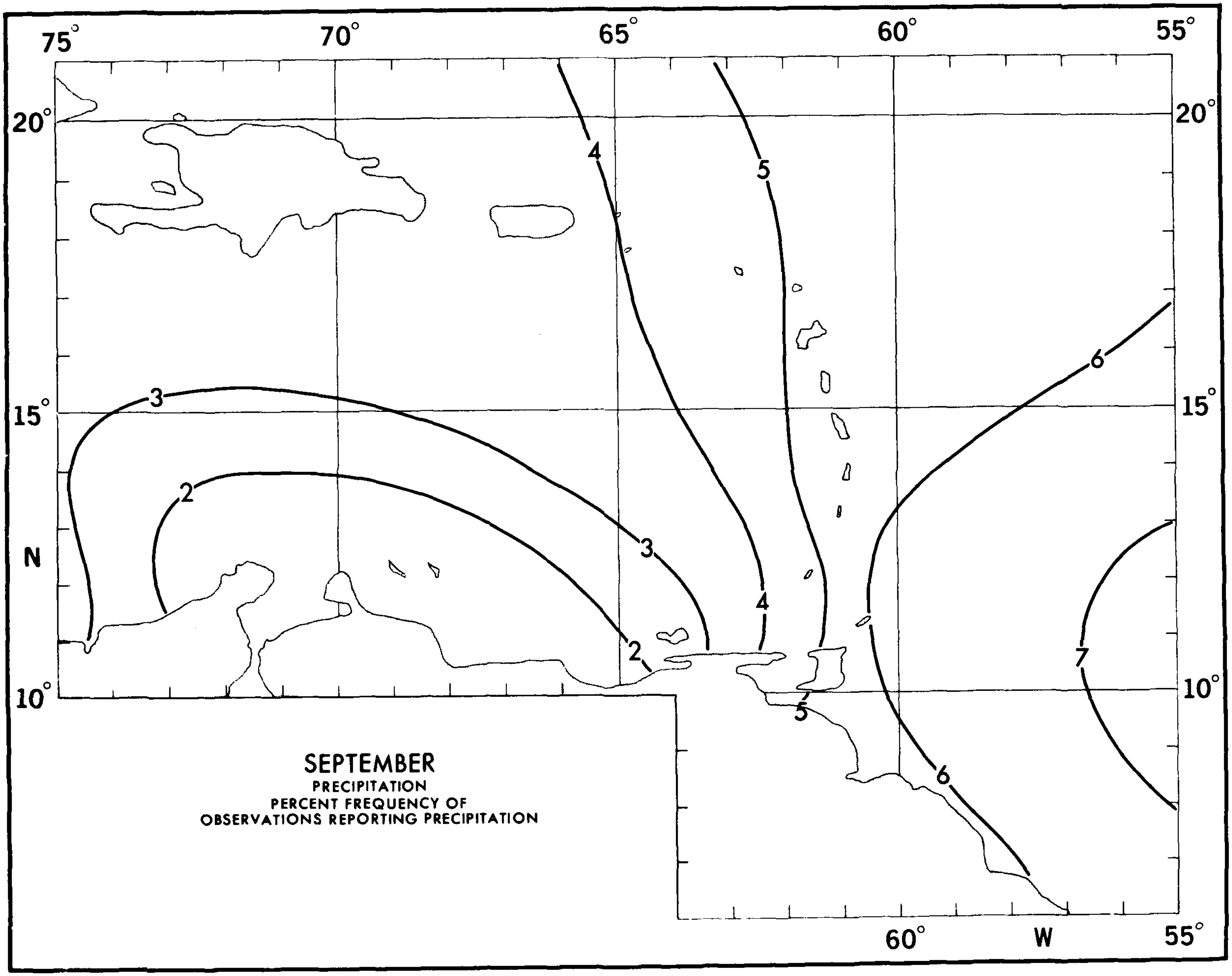
≤2						0.0	32.0	32.1	25.0	20.5
3-4						0.0	36.0	35.7	36.6	46.1
5-6						0.0	32.0	25.0	26.8	25.6
7-9						0.0	0.0	3.6	9.8	5.9
10-12						100.0	0.0	3.6	1.8	1.4
≥13						0.0	0.0	0.0	0.0	0.5
N=						1	25	28	112	219

≤2							0.0	37.5	25.0	43.4
3-4							0.0	37.5	45.0	32.1
5-6							0.0	12.5	20.0	20.8
7-9							100.0	0.0	10.0	0.0
10-12							0.0	0.0	0.0	3.8
≥13							0.0	12.5	0.0	0.0
N=							1	8	20	53

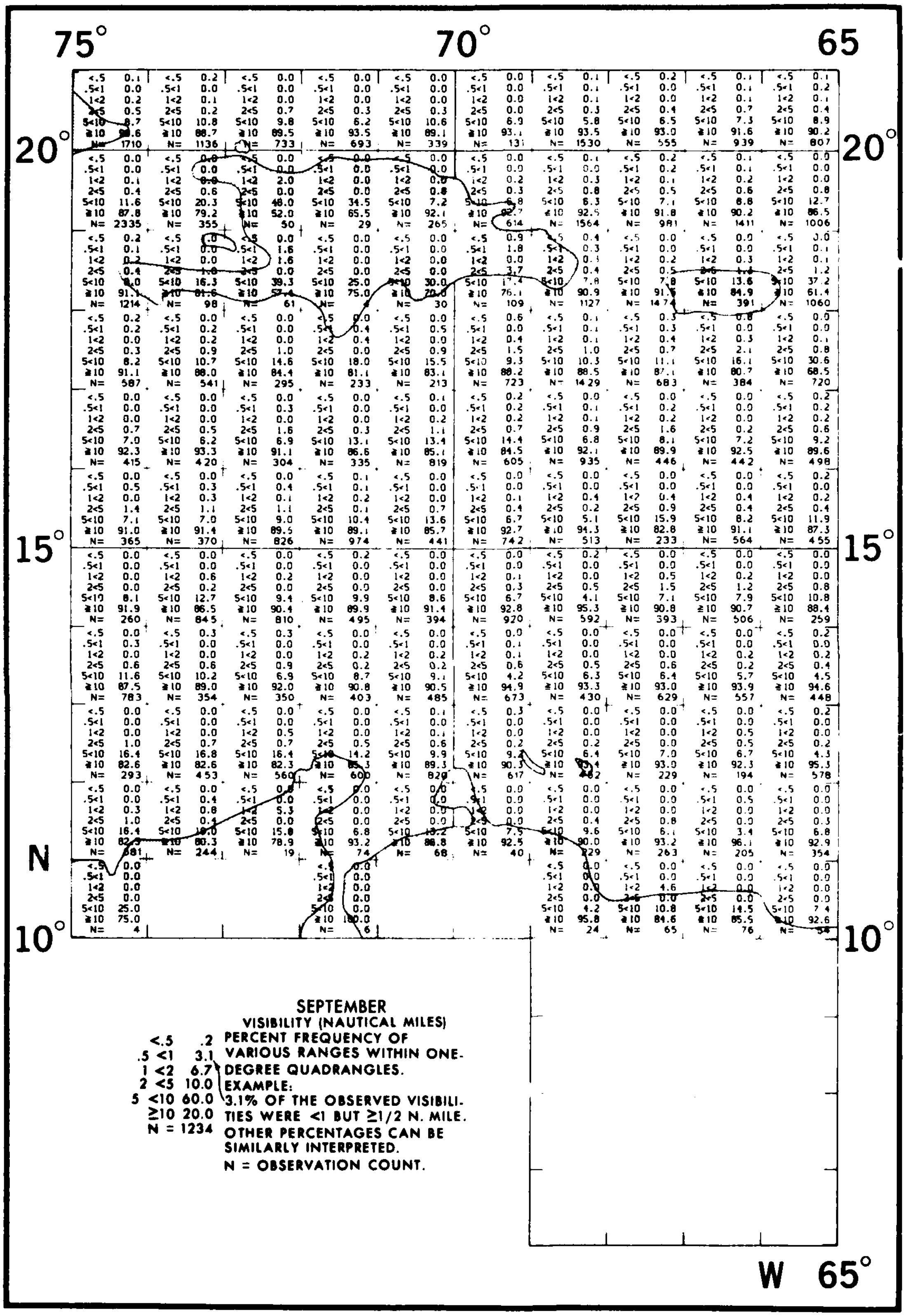
AUGUST
WAVE HEIGHT-FREQUENCIES

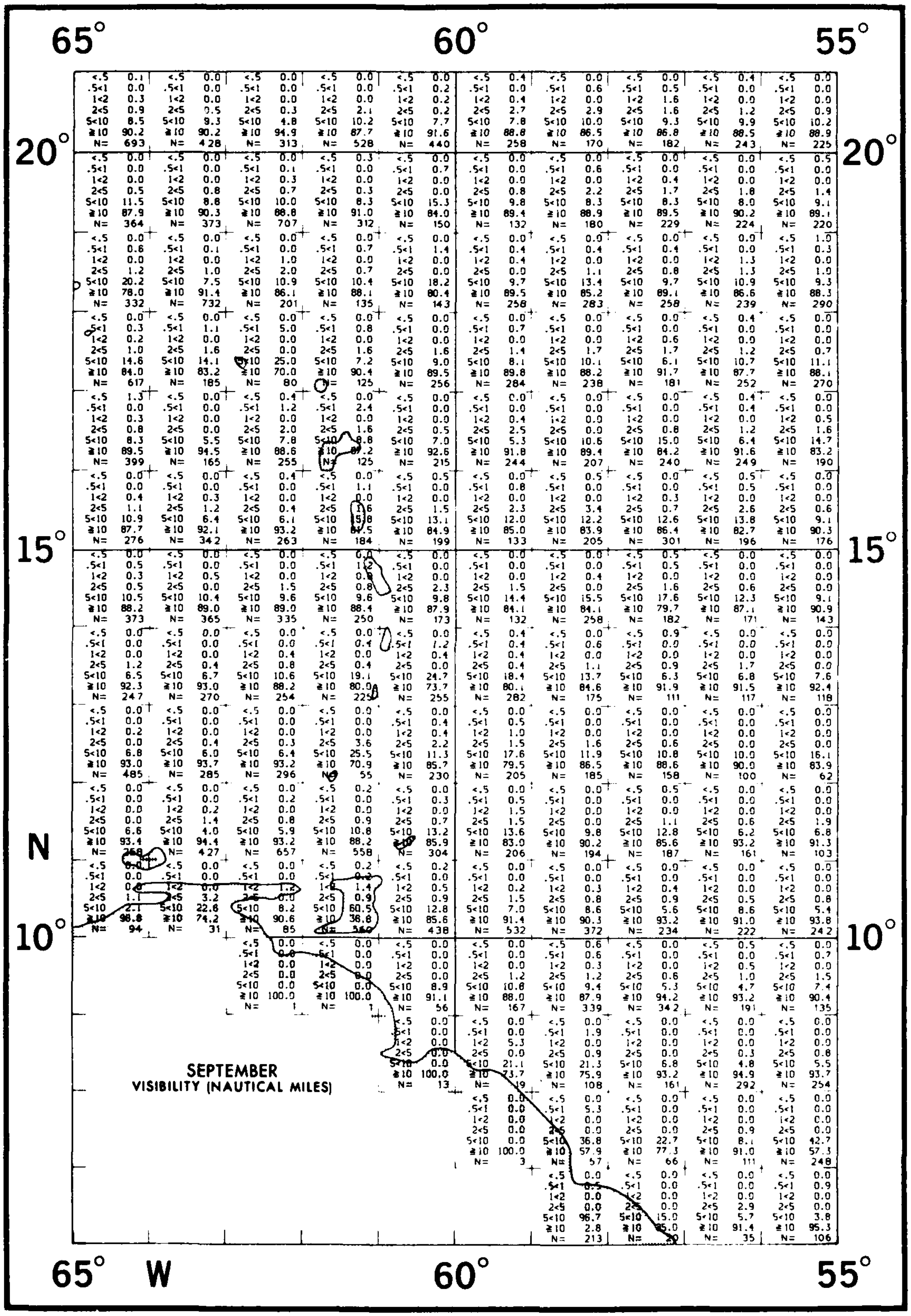
65° W 60° 55°

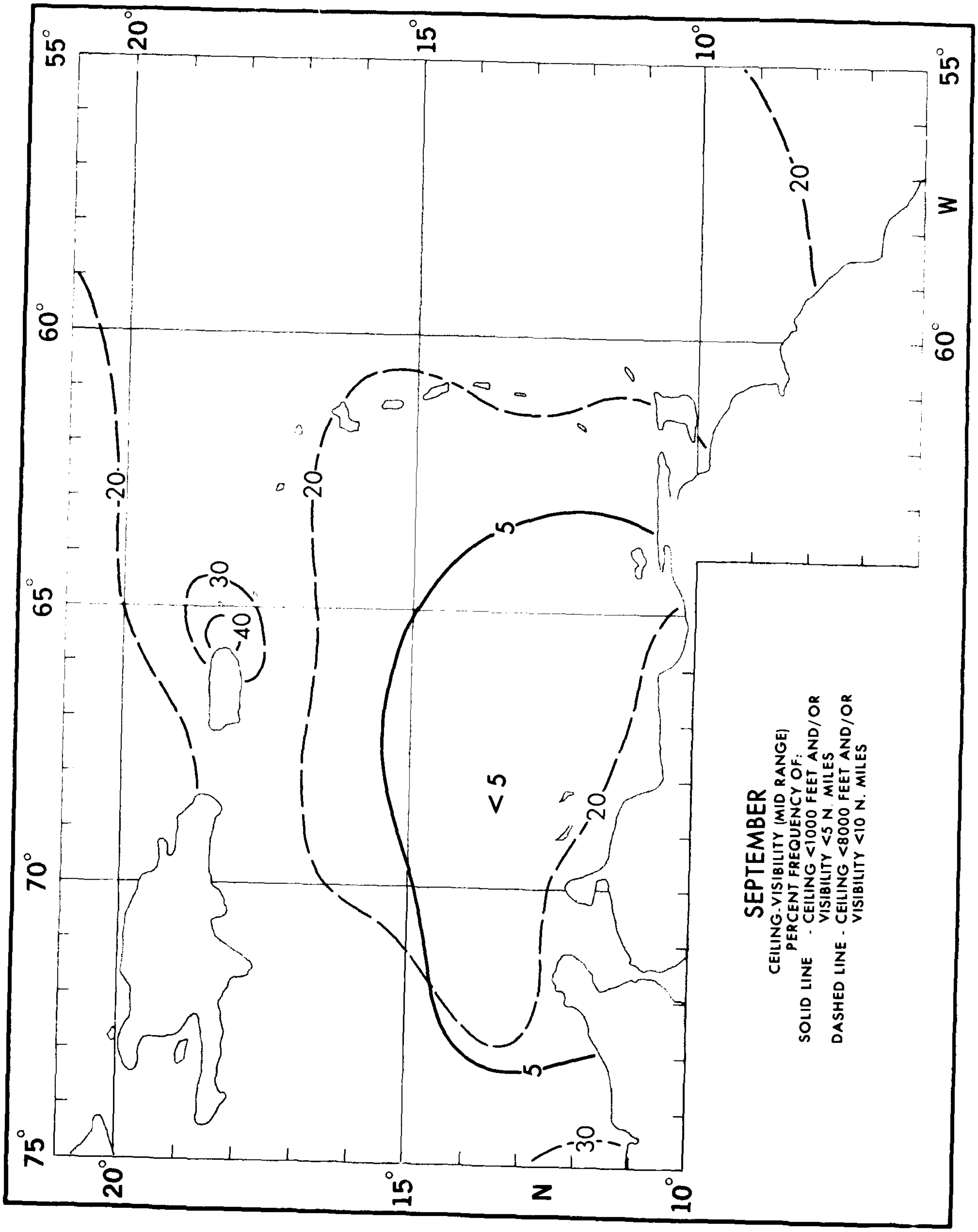

SEPTEMBER
CLOUD COVER
PERCENT FREQUENCY OF:
SOLID LINE · TOTAL CLOUD AMOUNT ≤2/8
DASHED LINE · LOW CLOUD AMOUNT ≥5/8
N
W
20°
15°
10°
55°
60°
65°
70°
75°
<20
30
40
20



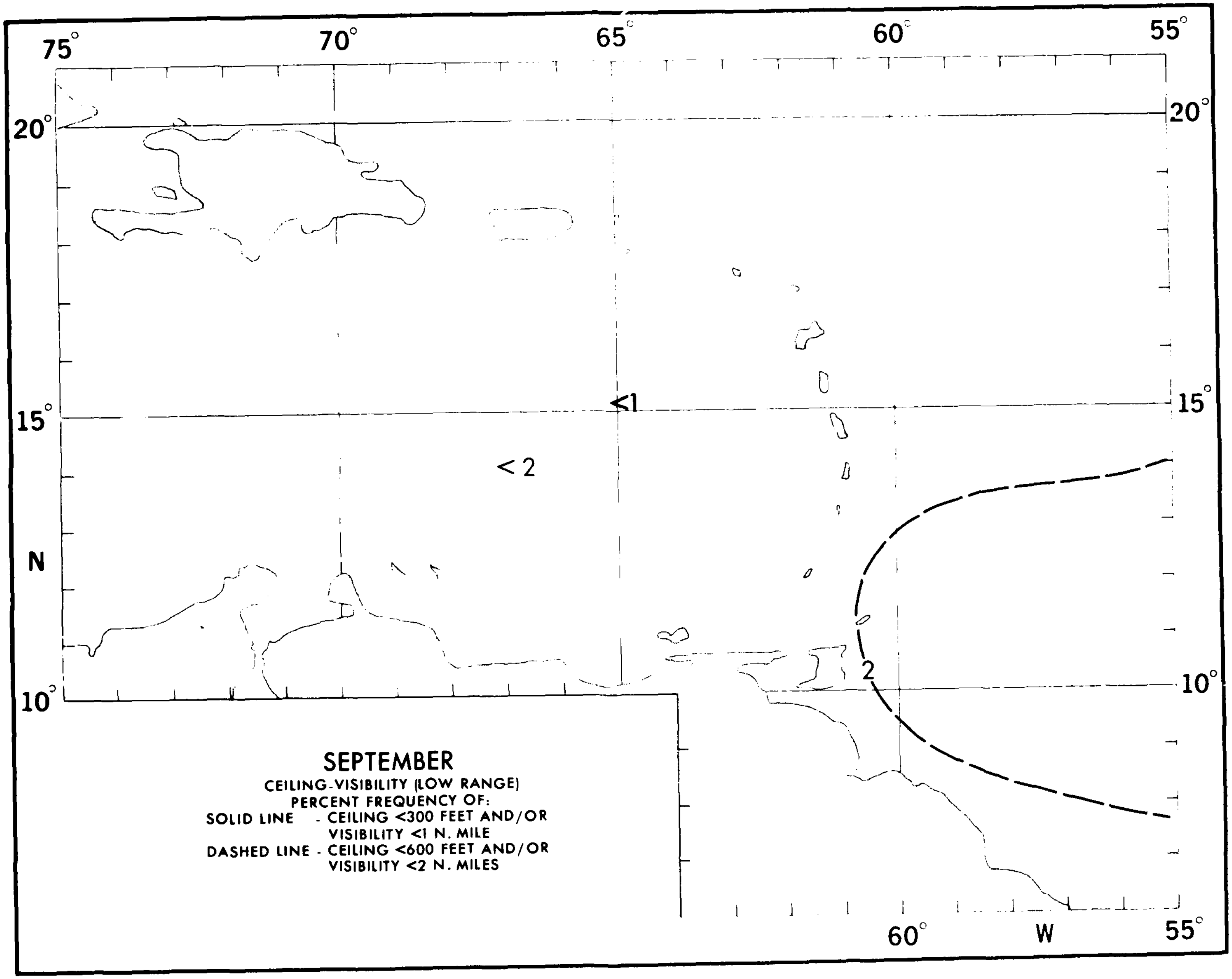
SEPTEMBER
PRECIPITATION
PERCENT FREQUENCY OF
OBSERVATIONS REPORTING PRECIPITATION


75°
70°
65
20°
15°
10°
N
W 65°
SEPTEMBER
VISIBILITY (NAUTICAL MILES)
PERCENT FREQUENCY OF VARIOUS RANGES WITHIN ONE-DEGREE QUADRANGLES.
EXAMPLE:
<.5 .2
.5 <1 3.1
1 <2 6.7
2 <5 10.0
5 <10 60.0
≥10 20.0
N = 1234
3.1% OF THE OBSERVED VISIBILITIES WERE <1 BUT ≥1/2 N. MILE. OTHER PERCENTAGES CAN BE SIMILARLY INTERPRETED.
N = OBSERVATION COUNT.

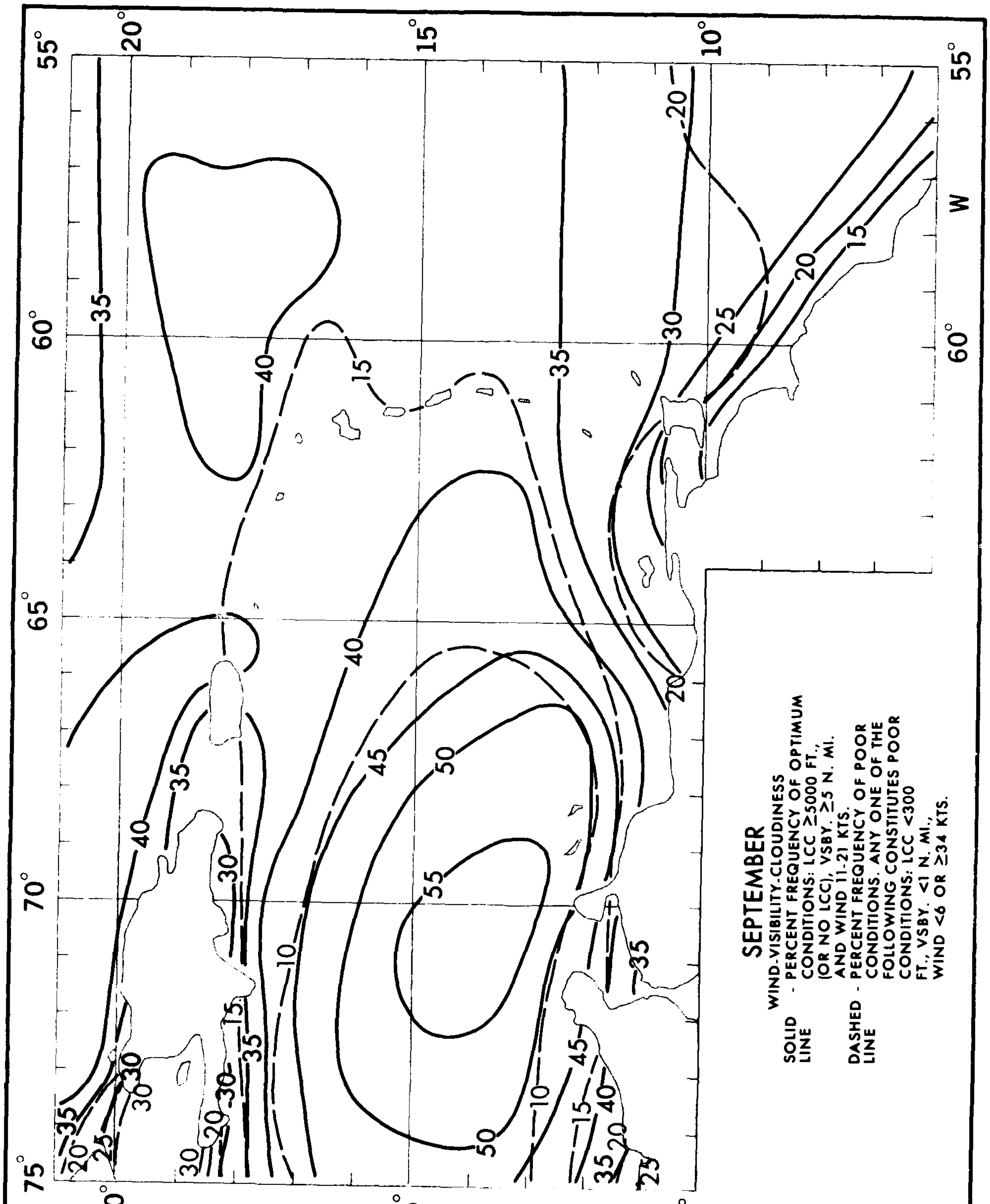

65°
60°
55°
20°
15°
10°
N
W
SEPTEMBER
VISIBILITY (NAUTICAL MILES)



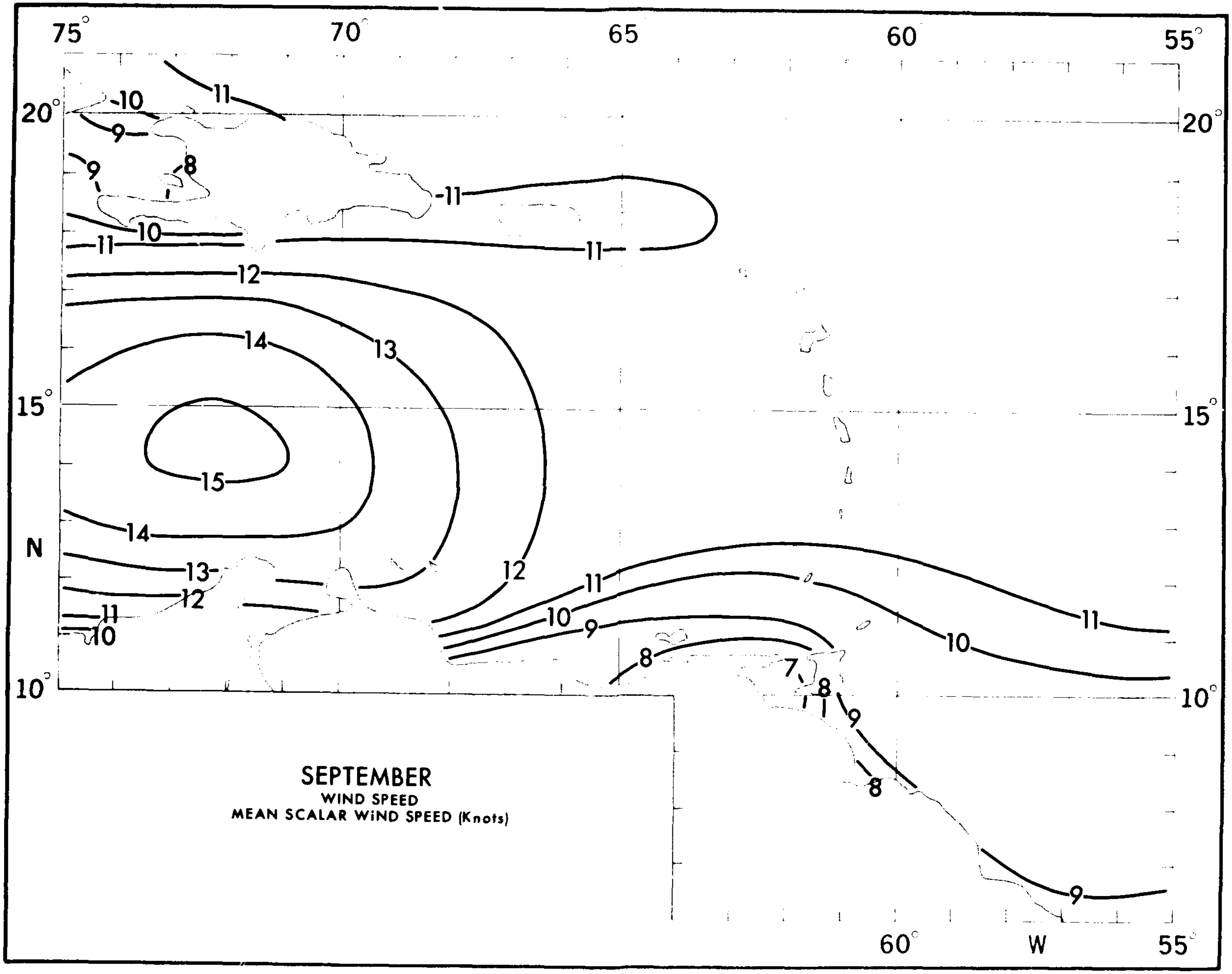
SEPTEMBER
CEILING-VISIBILITY (MID RANGE)
PERCENT FREQUENCY OF:
SOLID LINE - CEILING <1000 FEET AND/OR VISIBILITY <5 N. MILES
DASHED LINE - CEILING <8000 FEET AND/OR VISIBILITY <10 N. MILES
75°
70°
65°
60°
55°
20°
15°
10°
N
W
20
30
40
5
<5



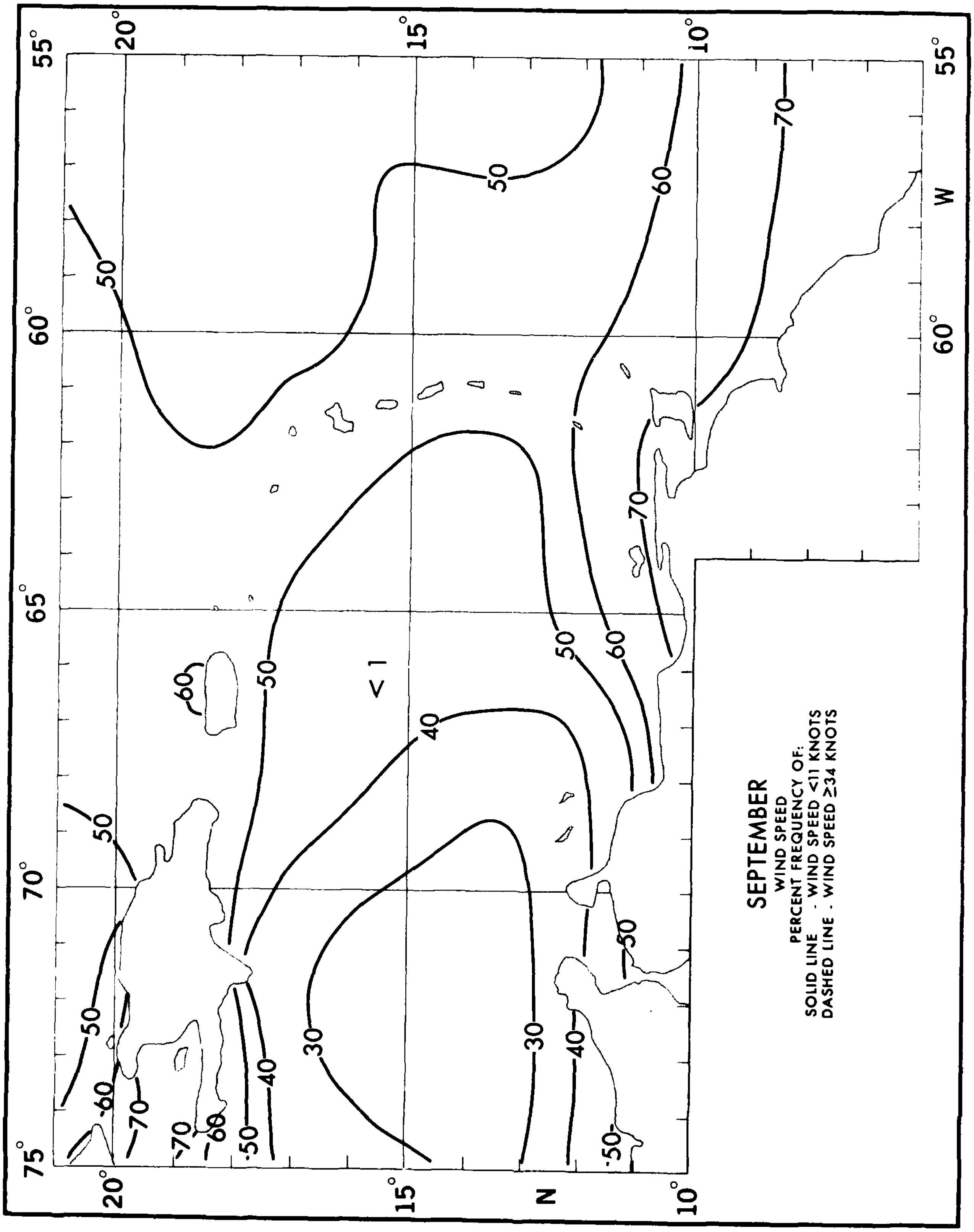
75°
70°
65°
60°
55°
20°
15°
10°
N
W
<1
< 2
2
SEPTEMBER
CEILING-VISIBILITY (LOW RANGE)
PERCENT FREQUENCY OF:
SOLID LINE - CEILING <300 FEET AND/OR VISIBILITY <1 N. MILE
DASHED LINE - CEILING <600 FEET AND/OR VISIBILITY <2 N. MILES

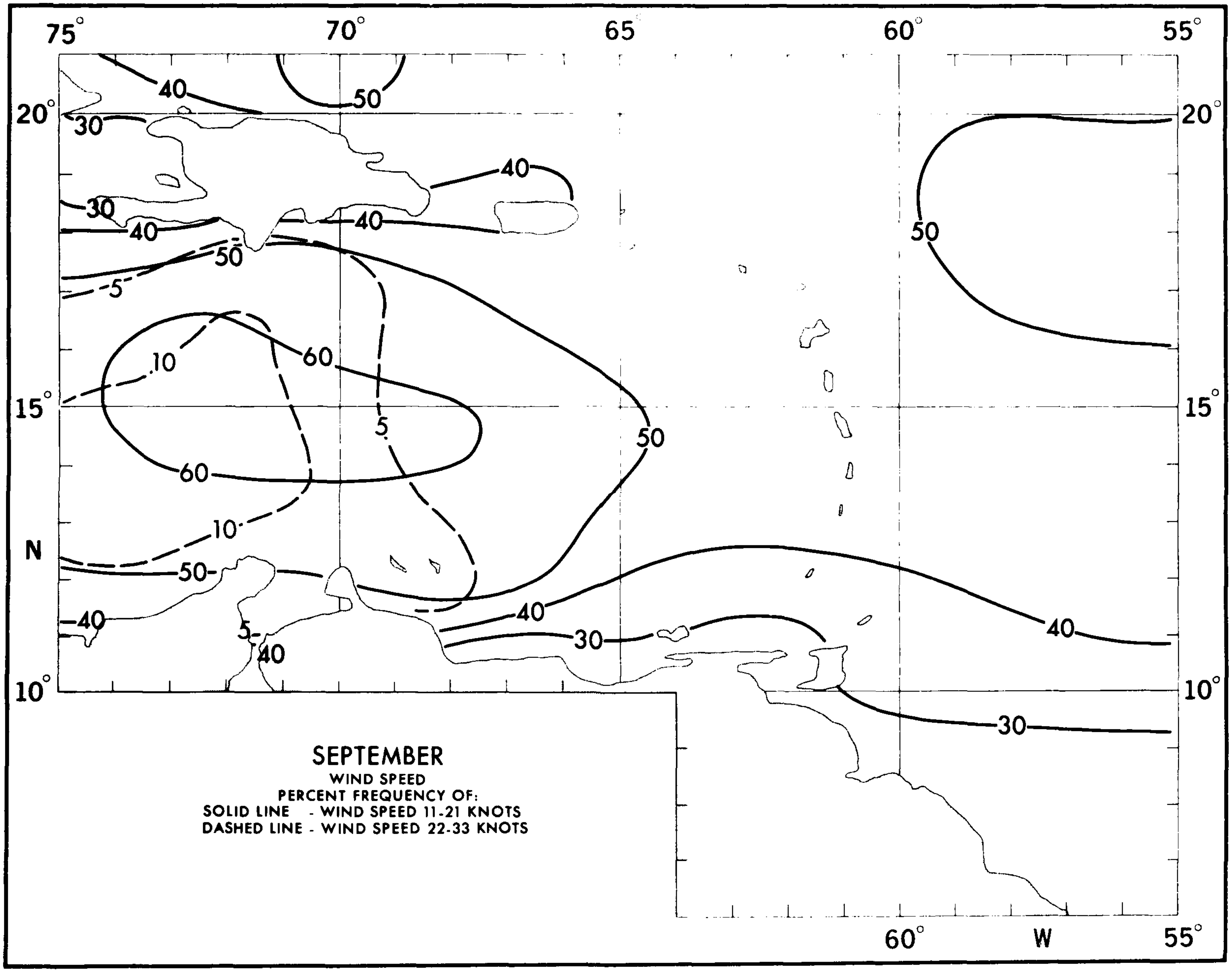


SEPTEMBER
WIND-VISIBILITY-CLOUDINESS
SOLID LINE - PERCENT FREQUENCY OF OPTIMUM CONDITIONS: LCC ≥5000 FT., (OR NO LCC), VSBY. ≥5 N. MI. AND WIND 11-21 KTS.
DASHED LINE - PERCENT FREQUENCY OF POOR CONDITIONS. ANY ONE OF THE FOLLOWING CONSTITUTES POOR CONDITIONS: LCC <300 FT., VSBY. <1 N. MI., WIND <6 OR ≥34 KTS.
55°
60°
65°
70°
75°
W
20°
15°
10°
N

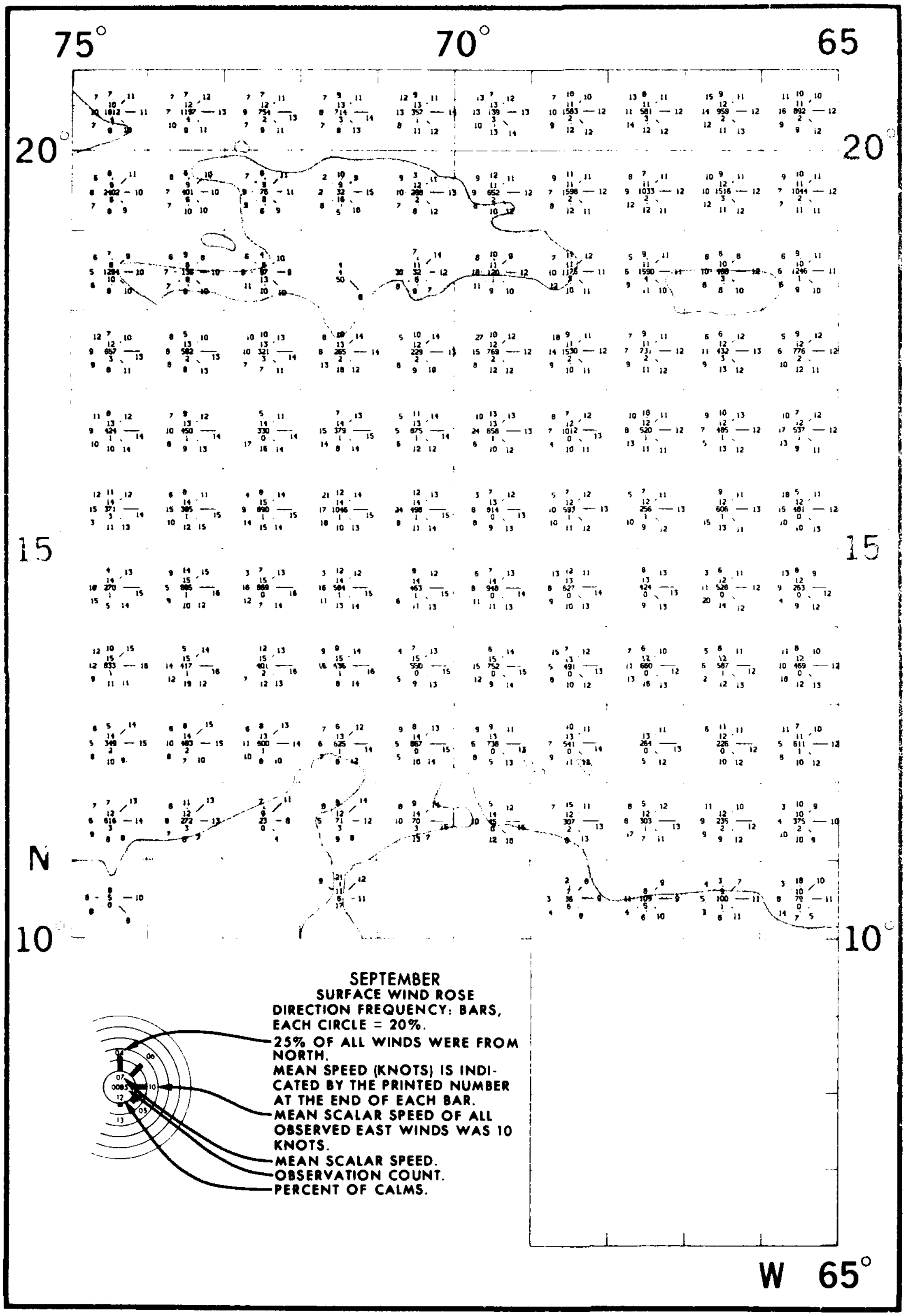


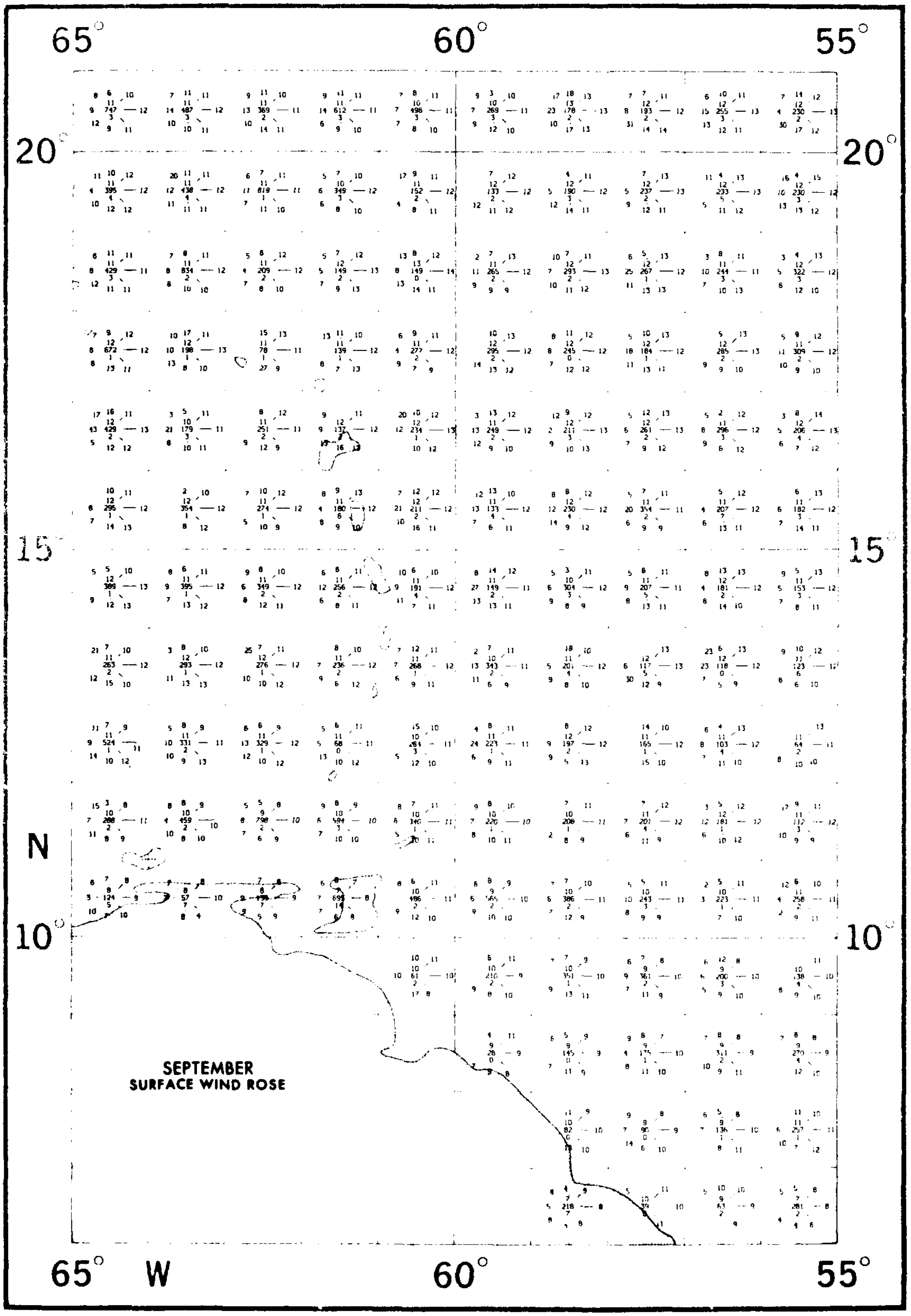
SEPTEMBER
WIND SPEED
MEAN SCALAR WIND SPEED (Knots)

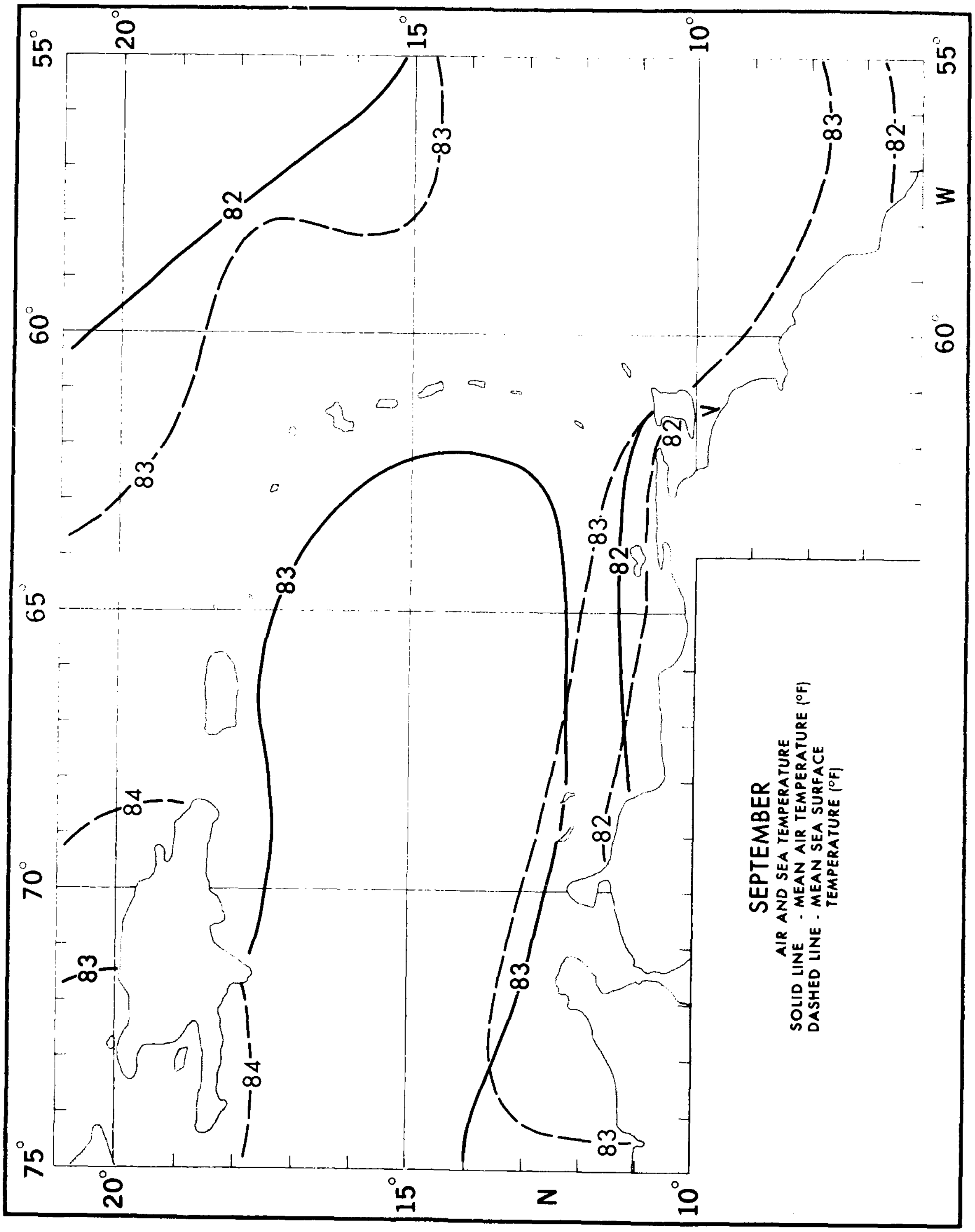

SEPTEMBER
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE - WIND SPEED <11 KNOTS
DASHED LINE . WIND SPEED ≥34 KNOTS
<1
N
W
75°
70°
65°
60°
55°
20°
15°
10°

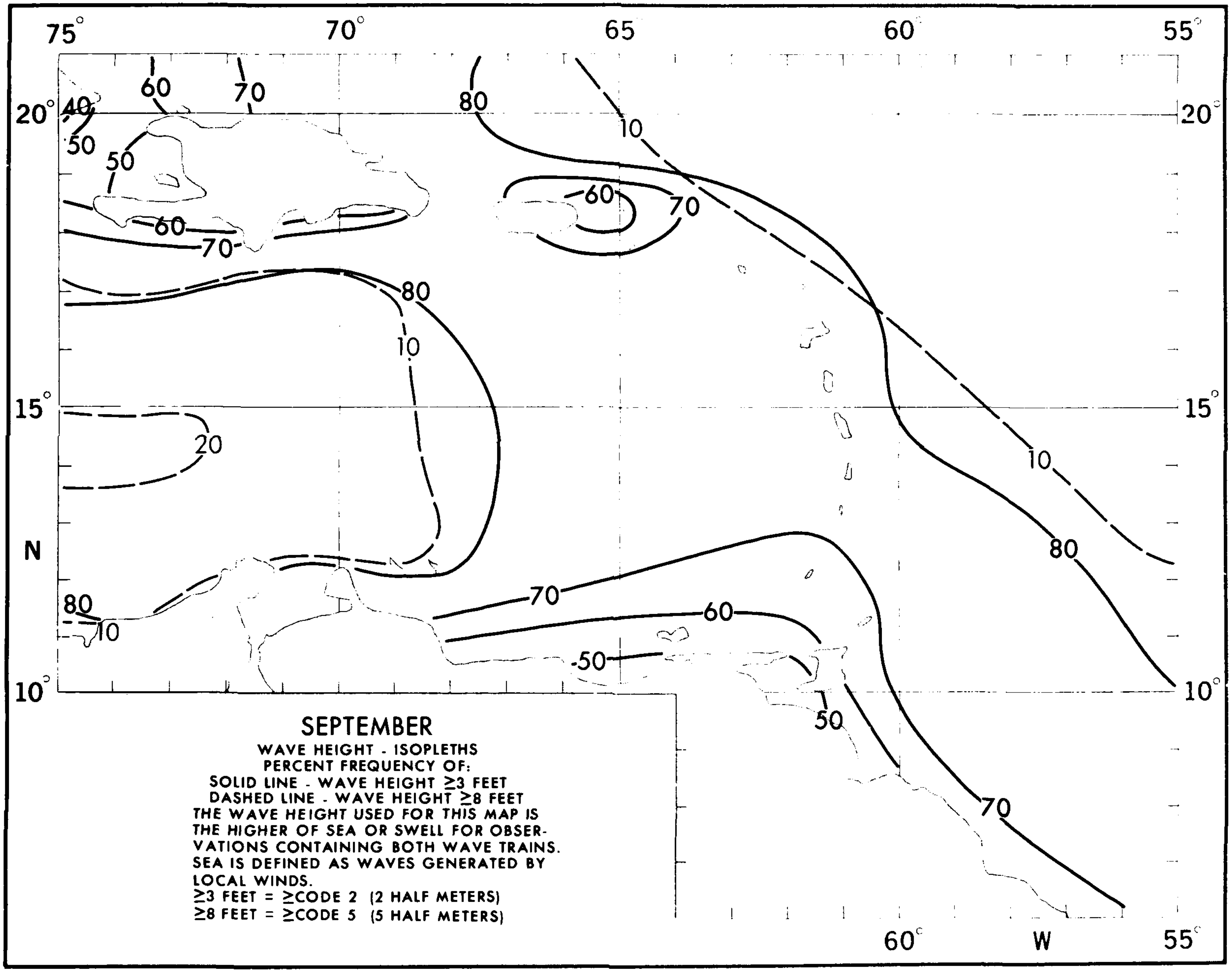


SEPTEMBER
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE - WIND SPEED 11-21 KNOTS
DASHED LINE - WIND SPEED 22-33 KNOTS


75°
70°
65
20°
20°
15
15
N
10°
10°
SEPTEMBER
SURFACE WIND ROSE
DIRECTION FREQUENCY: BARS, EACH CIRCLE = 20%.
25% OF ALL WINDS WERE FROM NORTH.
MEAN SPEED (KNOTS) IS INDICATED BY THE PRINTED NUMBER AT THE END OF EACH BAR.
MEAN SCALAR SPEED OF ALL OBSERVED EAST WINDS WAS 10 KNOTS.
MEAN SCALAR SPEED.
OBSERVATION COUNT.
PERCENT OF CALMS.
W 65°


65°
60°
55°
20°
15°
10°
N
W
SEPTEMBER
SURFACE WIND ROSE


SEPTEMBER
AIR AND SEA TEMPERATURE
SOLID LINE - MEAN AIR TEMPERATURE (°F)
DASHED LINE - MEAN SEA SURFACE TEMPERATURE (°F)



SEPTEMBER
WAVE HEIGHT - ISOPLETHS
PERCENT FREQUENCY OF:
SOLID LINE - WAVE HEIGHT ≥3 FEET
DASHED LINE - WAVE HEIGHT ≥8 FEET
THE WAVE HEIGHT USED FOR THIS MAP IS THE HIGHER OF SEA OR SWELL FOR OBSERVATIONS CONTAINING BOTH WAVE TRAINS. SEA IS DEFINED AS WAVES GENERATED BY LOCAL WINDS.
≥3 FEET = ≥CODE 2 (2 HALF METERS)
≥8 FEET = ≥CODE 5 (5 HALF METERS)

75° 70° 65°

20° — 20°

≤2	42.4	34.9	34.7	23.0	25.9	19.6	21.1	18.3	19.0	18.8
3-4	31.6	31.0	31.5	36.8	35.3	30.8	31.7	35.8	35.3	27.3
5-6	17.1	20.4	21.1	24.0	24.8	29.9	28.5	25.5	26.1	31.4
7-9	7.8	11.2	10.5	14.3	11.5	16.8	15.7	17.9	15.3	15.7
10-12	0.9	2.4	1.4	1.6	1.7	2.8	2.4	1.9	3.3	4.6
≥13	0.2	0.1	0.8	0.2	0.7	0.0	0.6	0.6	1.0	2.1
N=	1289	917	622	608	286	107	1270	475	811	605
≤2	49.8	53.4	50.0	53.3	25.7	24.8	22.3	19.2	16.9	23.0
3-4	28.6	28.4	33.3	33.3	33.6	33.5	36.0	32.6	32.2	36.5
5-6	13.4	10.2	8.3	6.7	28.2	25.2	25.3	25.5	27.3	21.2
7-9	6.2	5.9	4.2	6.7	9.5	14.6	14.1	19.2	19.8	15.6
10-12	1.4	1.7	4.2	0.0	2.1	1.3	1.9	2.8	3.1	2.8
≥13	0.6	0.4	0.0	0.0	0.8	0.7	0.4	0.7	1.0	0.9
N=	1730	236	24	15	241	556	1318	813	1131	808
≤2	41.3	55.1	47.4	100.0	21.1	39.2	26.0	27.3	36.8	45.6
3-4	30.5	26.5	10.5	0.0	47.4	38.2	35.0	34.2	30.3	39.3
5-6	17.6	10.2	26.3	0.0	5.3	10.8	23.3	21.2	18.0	9.0
7-9	9.0	10.2	15.8	0.0	26.3	8.8	12.3	14.2	13.4	5.1
10-12	1.3	0.0	0.0	0.0	0.0	2.0	2.7	2.4	1.2	0.5
≥13	0.3	0.0	0.0	0.0	0.0	1.0	0.8	0.7	0.3	0.6
N=	892	49	19	3	19	102	928	1209	323	882
≤2	24.3	21.2	21.4	15.9	18.2	20.9	23.5	28.4	24.3	35.7
3-4	31.2	32.6	32.1	33.0	30.3	27.8	34.5	32.6	35.9	37.6
5-6	21.0	23.0	21.0	22.7	31.5	26.7	24.3	21.2	23.7	16.3
7-9	20.6	20.2	23.2	22.7	15.2	20.0	15.2	14.5	13.7	9.1
10-12	2.0	2.5	0.9	5.1	3.0	2.5	2.0	2.9	2.1	1.0
≥13	0.9	0.5	1.3	0.6	1.8	2.2	0.5	0.3	0.3	0.2
N=	461	405	224	176	165	604	1128	580	329	582
≤2	17.3	15.2	18.4	10.1	11.6	15.0	18.9	24.6	21.7	19.3
3-4	31.3	24.4	25.0	24.5	28.1	30.0	35.1	37.6	36.1	34.7
5-6	26.6	33.4	26.8	25.6	26.8	28.7	25.2	24.6	23.6	26.6
7-9	19.9	23.9	25.9	31.0	25.9	23.0	18.2	9.7	16.3	16.2
10-12	3.5	2.8	3.5	7.6	5.8	2.9	1.7	3.6	1.9	2.3
≥13	1.5	0.3	0.4	1.1	1.7	0.4	0.8	0.0	0.3	0.8
N=	342	356	228	277	637	453	709	362	368	383
≤2	16.4	12.2	12.6	9.4	12.9	19.0	16.8	19.8	20.4	22.1
3-4	30.0	23.5	25.4	24.4	25.1	32.7	31.4	33.7	37.6	34.1
5-6	23.3	23.5	25.3	27.6	30.0	26.1	32.0	25.6	26.1	27.8
7-9	22.6	34.2	28.5	29.5	26.6	17.7	16.5	17.4	14.0	14.2
10-12	5.9	4.7	6.5	7.1	5.1	4.3	2.6	2.3	1.6	1.5
≥13	1.7	1.9	1.6	1.9	0.3	0.2	0.8	1.2	0.2	0.3
N=	287	319	680	775	350	605	388	172	436	331

15° — 15°

≤2	12.9	11.4	8.1	14.5	14.5	16.2	13.0	17.2	24.1	23.6
3-4	29.7	19.4	22.5	23.2	29.6	31.1	32.5	34.7	35.4	36.2
5-6	23.3	25.1	24.7	23.4	29.6	28.3	30.7	31.0	24.6	24.6
7-9	19.3	29.9	34.6	32.6	22.7	20.5	20.1	13.2	13.6	13.6
10-12	11.9	11.7	7.5	4.7	2.0	3.4	2.8	3.3	2.1	1.5
≥13	3.0	2.5	2.5	1.6	1.6	0.5	0.9	0.7	0.3	0.5
N=	202	669	679	380	304	760	462	303	390	199
≤2	11.9	12.2	15.3	8.0	12.9	10.9	18.8	21.6	25.5	26.3
3-4	21.1	22.1	23.0	23.2	27.1	30.1	28.6	35.5	33.0	36.8
5-6	22.7	25.2	26.5	32.4	24.9	28.8	25.5	23.7	26.0	23.0
7-9	31.6	28.6	27.2	29.8	25.5	24.9	24.6	16.2	13.4	11.6
10-12	9.4	10.2	6.6	4.2	8.3	4.9	2.2	2.7	2.1	1.7
≥13	3.3	1.7	1.4	2.4	1.3	0.4	0.3	0.4	0.0	0.6
N=	598	294	287	336	373	531	325	482	470	361
≤2	17.5	11.9	17.5	16.2	14.0	17.8	14.1	15.9	23.6	28.6
3-4	24.1	28.5	31.6	29.0	31.4	28.7	32.3	32.3	34.0	38.7
5-6	27.6	23.5	26.0	27.8	27.2	28.7	27.0	29.9	27.8	20.6
7-9	20.6	28.8	20.2	21.0	23.9	20.6	22.4	18.9	12.5	11.2
10-12	7.9	6.0	3.9	5.3	3.0	3.8	4.2	1.8	2.1	0.6
≥13	2.2	1.3	0.8	0.8	0.5	0.5	0.0	1.2	0.0	0.2
N=	228	319	361	396	599	394	263	164	144	475
≤2	18.4	17.4	50.0	29.6	30.8	19.4	23.4	19.8	30.5	34.4
3-4	28.6	33.3	16.7	25.9	32.7	29.0	29.3	44.2	35.9	40.1
5-6	25.2	26.1	33.3	29.6	23.1	32.3	28.1	22.3	25.1	18.6
7-9	22.7	19.6	0.0	13.0	7.7	19.4	18.0	12.2	8.4	6.1
10-12	4.2	2.9	0.0	1.9	5.8	0.0	0.6	1.5	0.0	0.7
≥13	0.0	0.7	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0
N=	353	138	6	54	52	31	167	197	167	279
≤2	25.0			33.3			50.0	48.6	29.4	38.6
3-4	25.0			33.3			28.6	32.4	55.9	38.6
5-6	25.0			33.3			14.3	16.2	11.8	22.7
7-9	25.0			0.0			7.1	0.0	2.9	0.0
10-12	0.0			0.0			0.0	2.7	0.0	0.0
≥13	0.0			0.0			0.0	0.0	0.0	0.0
N=	4			6			14	37	34	44

N

10° — 10°

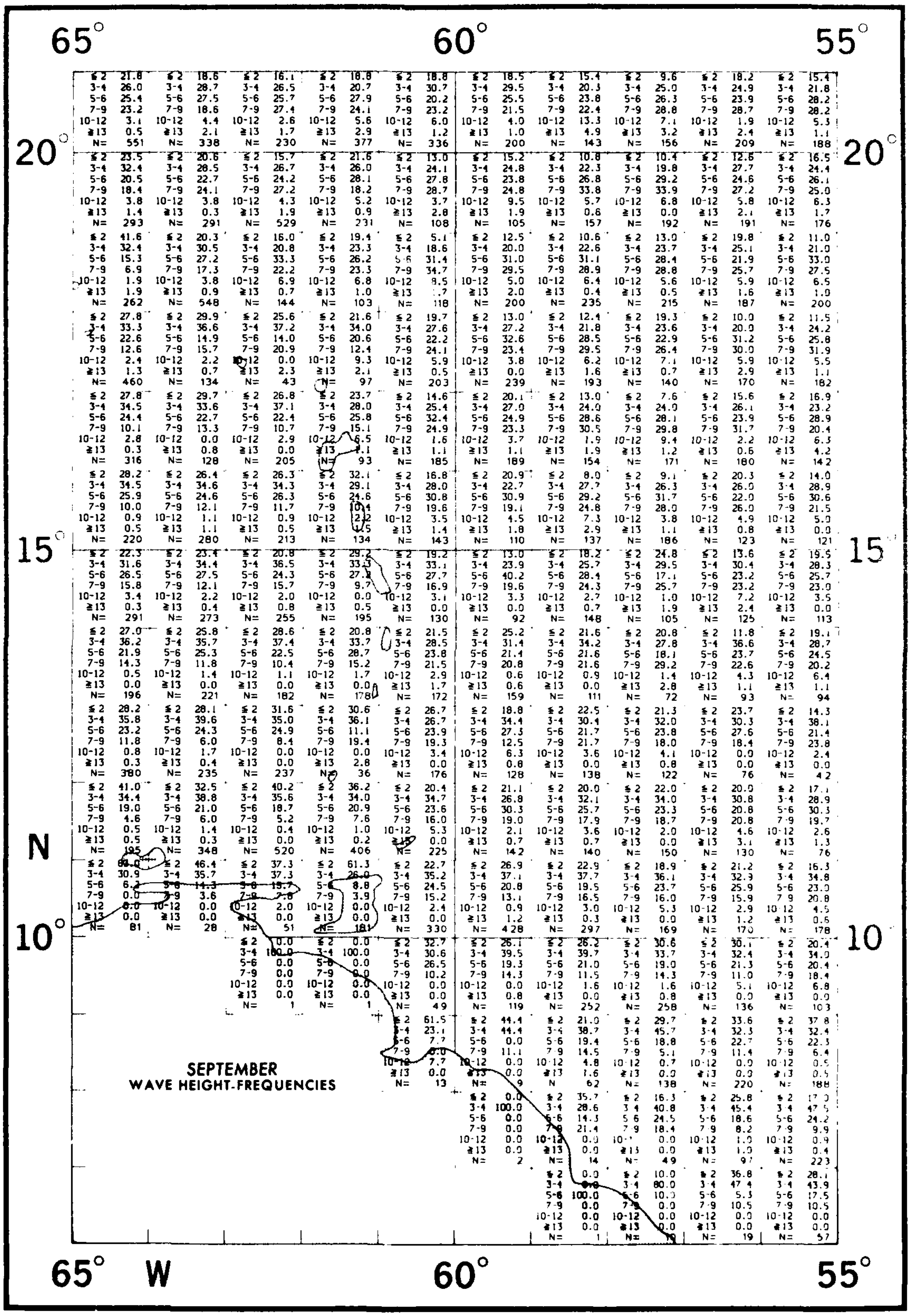
SEPTEMBER

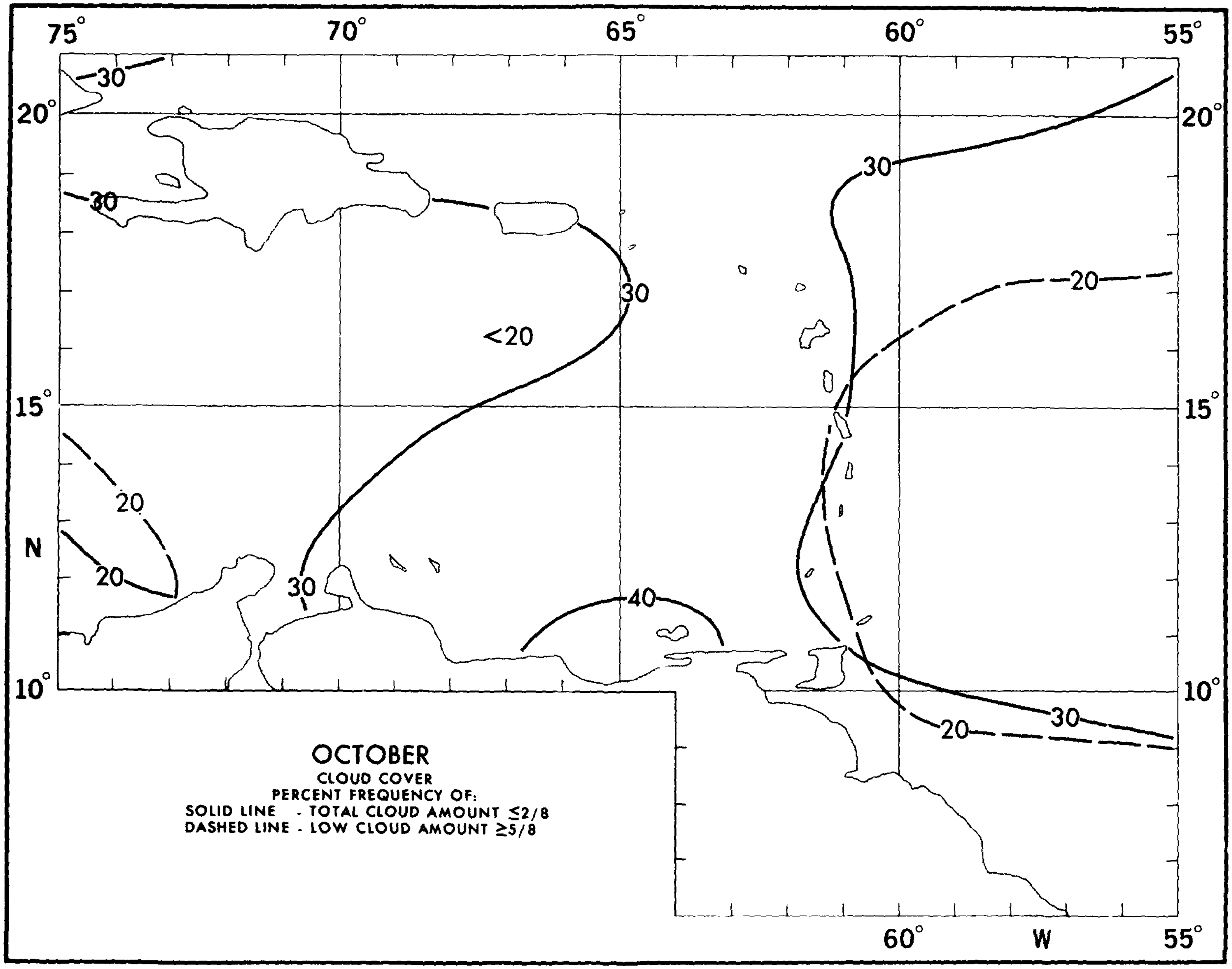
WAVE HEIGHT-FREQUENCIES

≤2	10.0	PERCENT FREQUENCY OF
3-4	20.0	VARIOUS RANGES WITHIN ONE-
5-6	30.0	DEGREE QUADRANGLES.
7-9	20.0	EXAMPLE:
10-12	10.0	30.0% OF ALL OBSERVED WAVE
≥13	10.0	HEIGHTS WERE IN THE RANGE 5
N =	1363	TO 6 FEET.

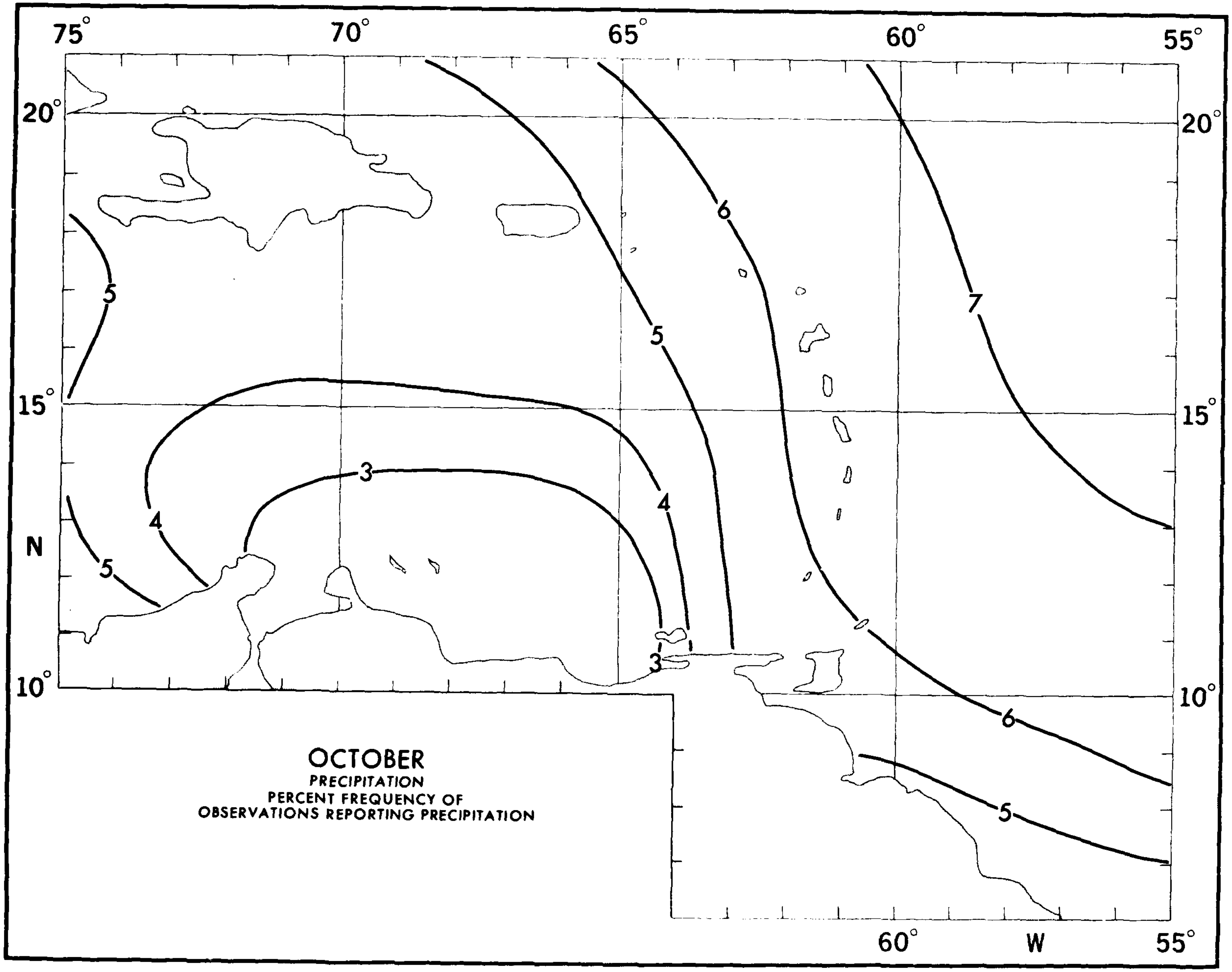
N = OBSERVATION COUNT.
WAVE DATA FOR THESE TABLES WERE SELECTED FROM THE HIGHER OF SEA OR SWELL WHEN BOTH WERE REPORTED.

W 65°

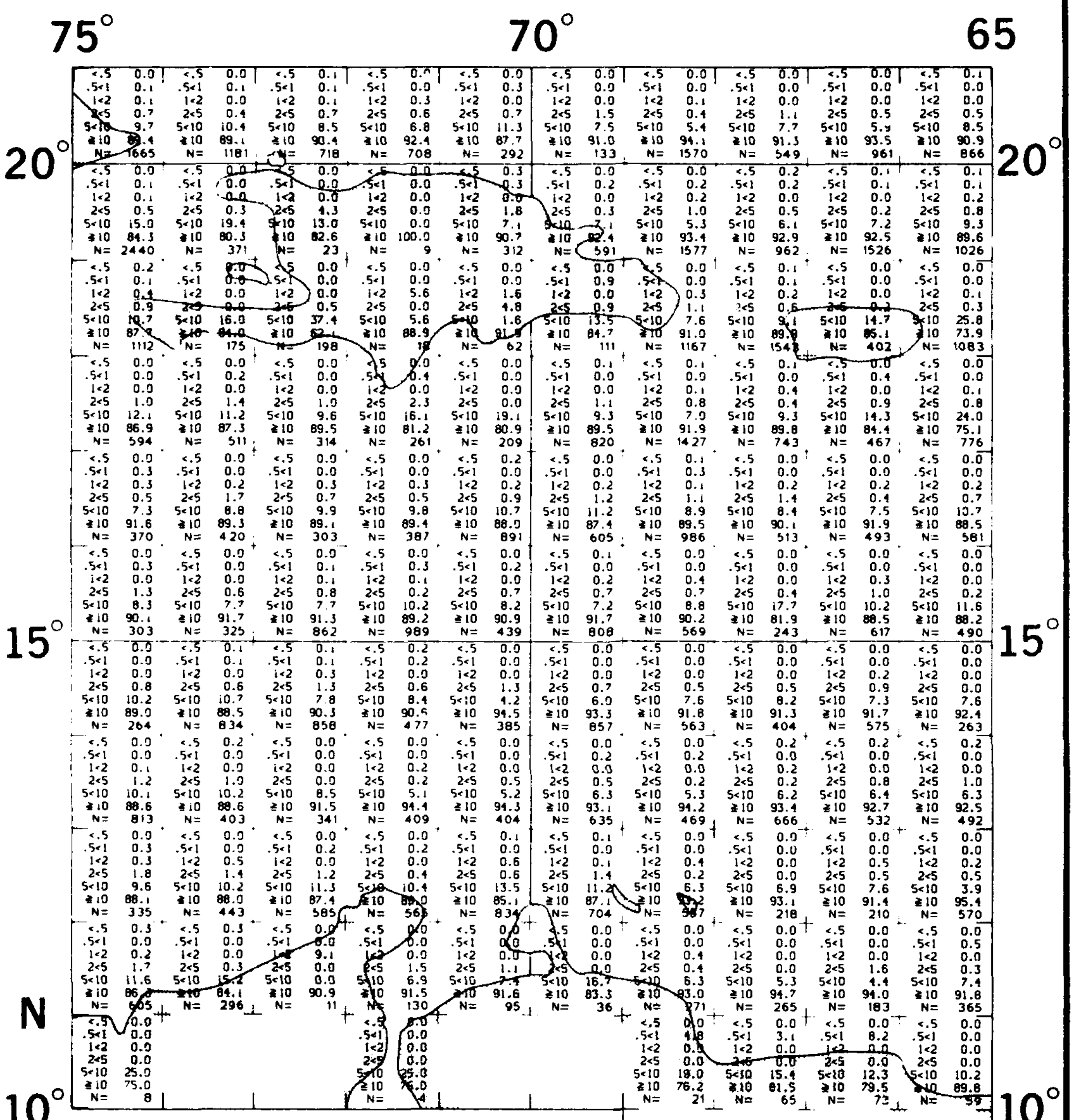

65°
60°
55°
20°
15°
10°
N
W
SEPTEMBER
WAVE HEIGHT-FREQUENCIES



OCTOBER
CLOUD COVER
PERCENT FREQUENCY OF:
SOLID LINE - TOTAL CLOUD AMOUNT ≤2/8
DASHED LINE - LOW CLOUD AMOUNT ≥5/8



OCTOBER
PRECIPITATION
PERCENT FREQUENCY OF
OBSERVATIONS REPORTING PRECIPITATION

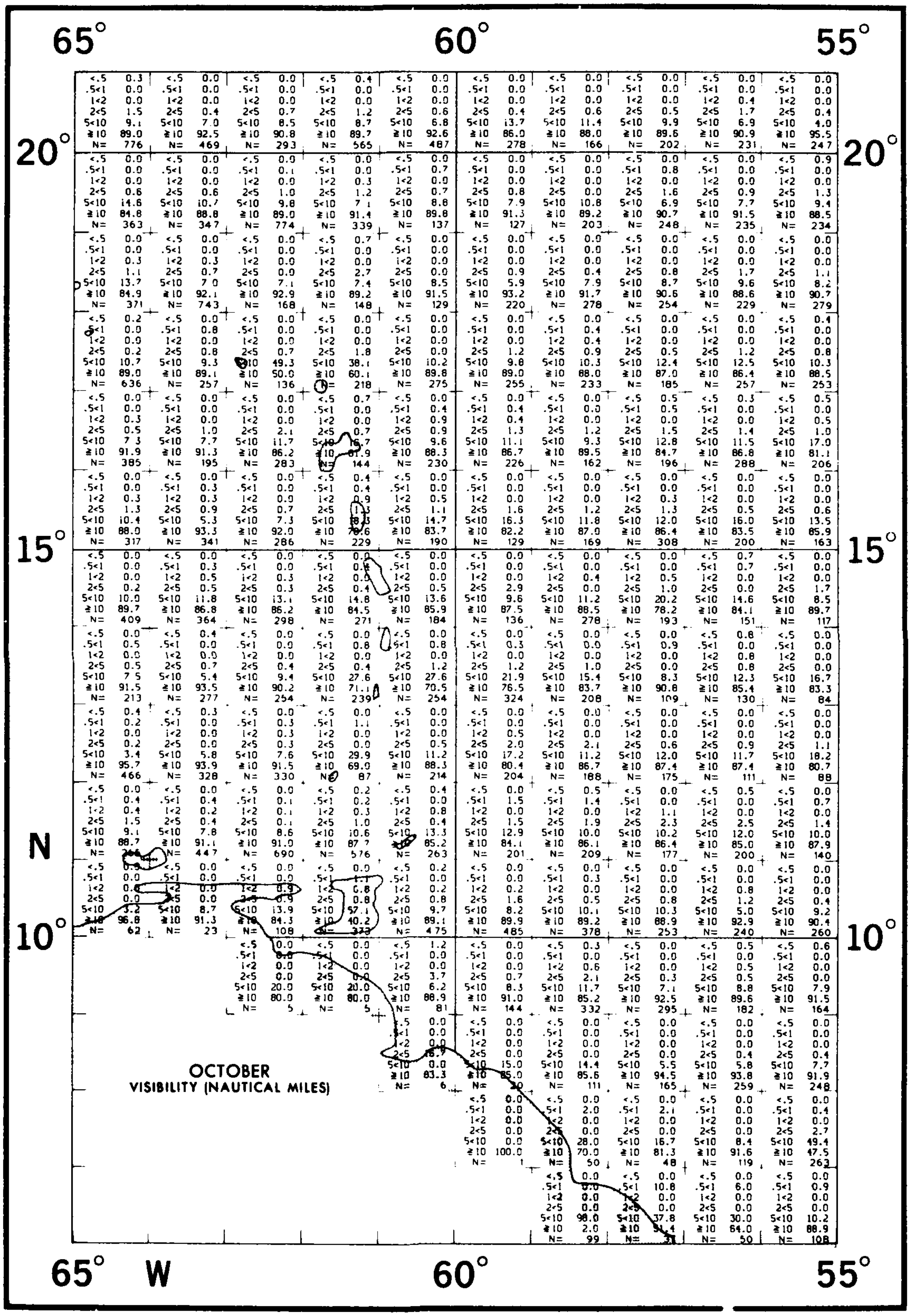


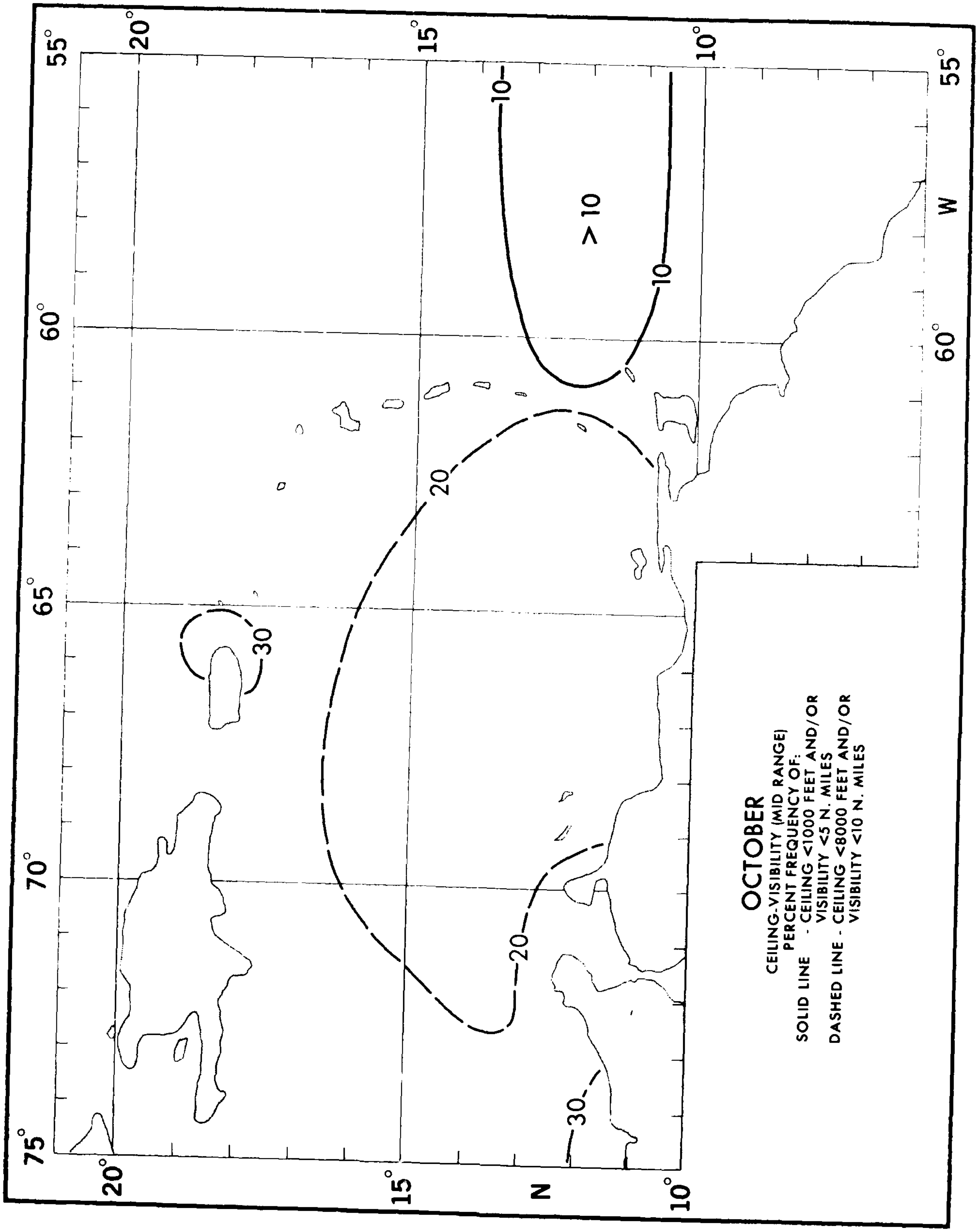
OCTOBER

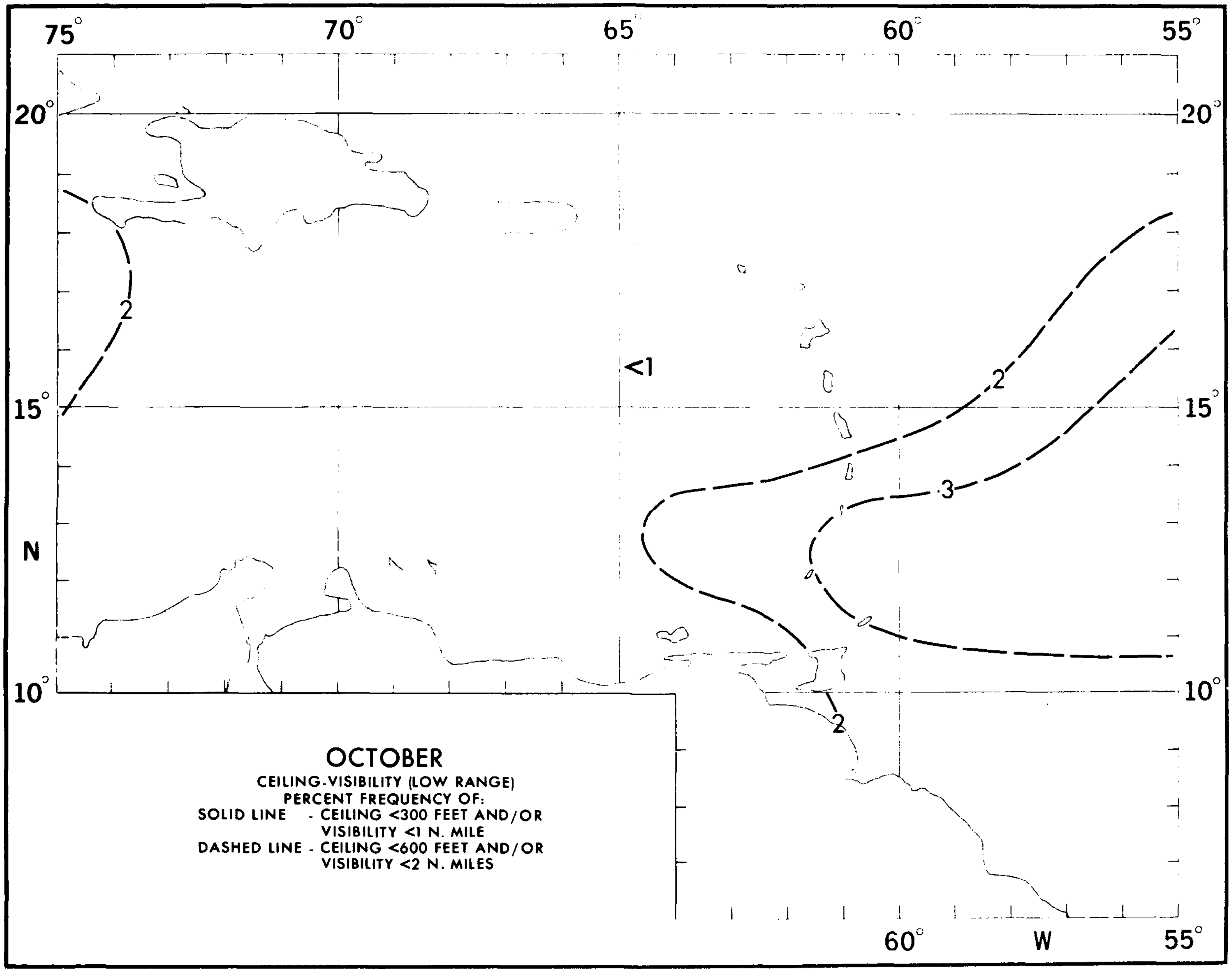
VISIBILITY (NAUTICAL MILES)

<.5	.2	PERCENT FREQUENCY OF VARIOUS RANGES WITHIN ONE-DEGREE QUADRANGLES.
.5 <1	3.1	EXAMPLE:
1 <2	6.7	3.1% OF THE OBSERVED VISIBILITIES WERE <1 BUT ≥1/2 N. MILE.
2 <5	10.0	OTHER PERCENTAGES CAN BE SIMILARLY INTERPRETED.
5 <10	60.0	N = OBSERVATION COUNT.
≥10	20.0	
N = 1234		

W 65°

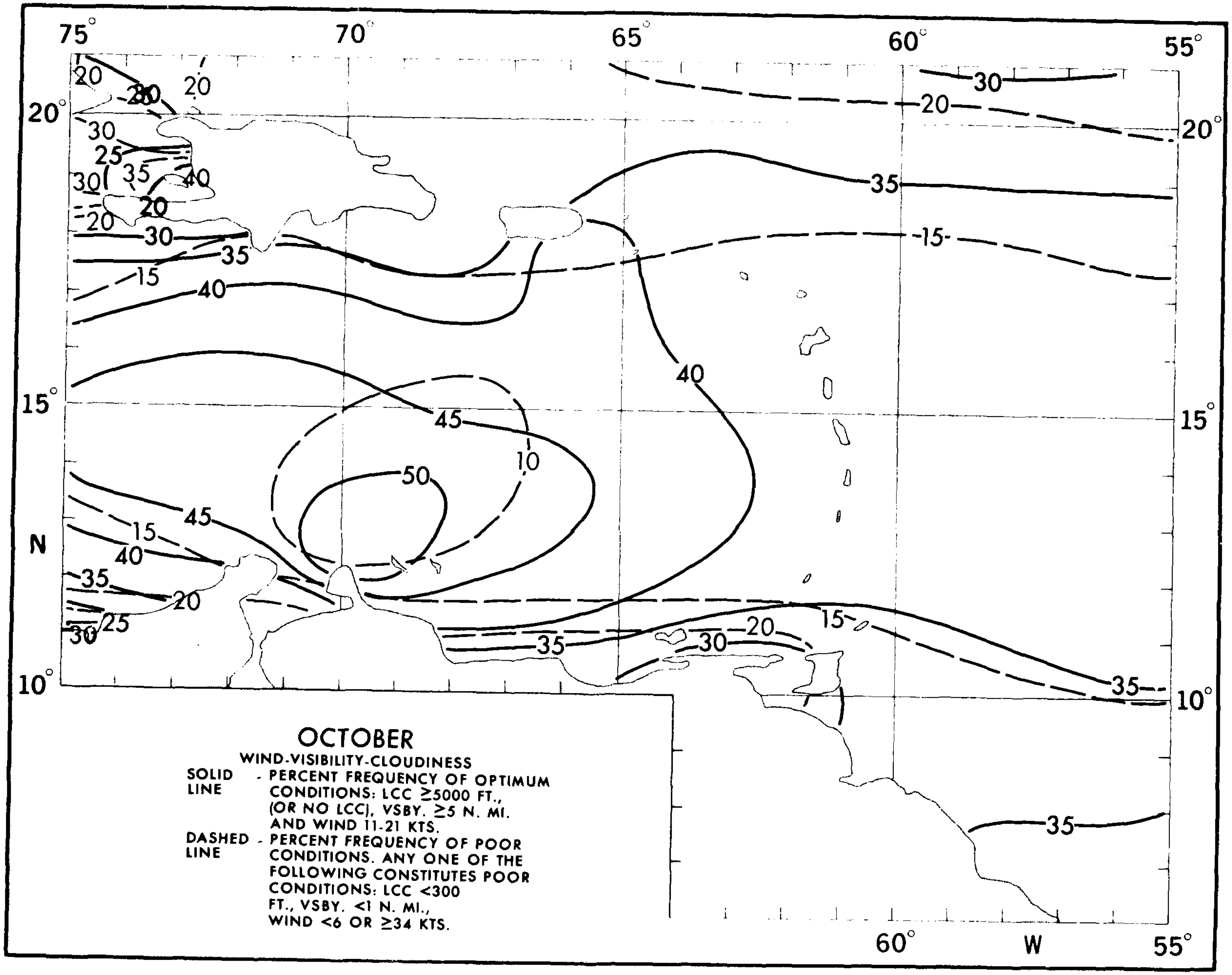

65°
60°
55°
20°
15°
10°
N
65° W
60°
55°
OCTOBER
VISIBILITY (NAUTICAL MILES)


OCTOBER
CEILING-VISIBILITY (MID RANGE)
PERCENT FREQUENCY OF:
SOLID LINE - CEILING <1000 FEET AND/OR VISIBILITY <5 N. MILES
DASHED LINE - CEILING <8000 FEET AND/OR VISIBILITY <10 N. MILES
75°
70°
65°
60°
55°
20°
15°
10°
N
W
10
>10
20
30



OCTOBER

CEILING-VISIBILITY (LOW RANGE)
PERCENT FREQUENCY OF:
SOLID LINE - CEILING <300 FEET AND/OR VISIBILITY <1 N. MILE
DASHED LINE - CEILING <600 FEET AND/OR VISIBILITY <2 N. MILES

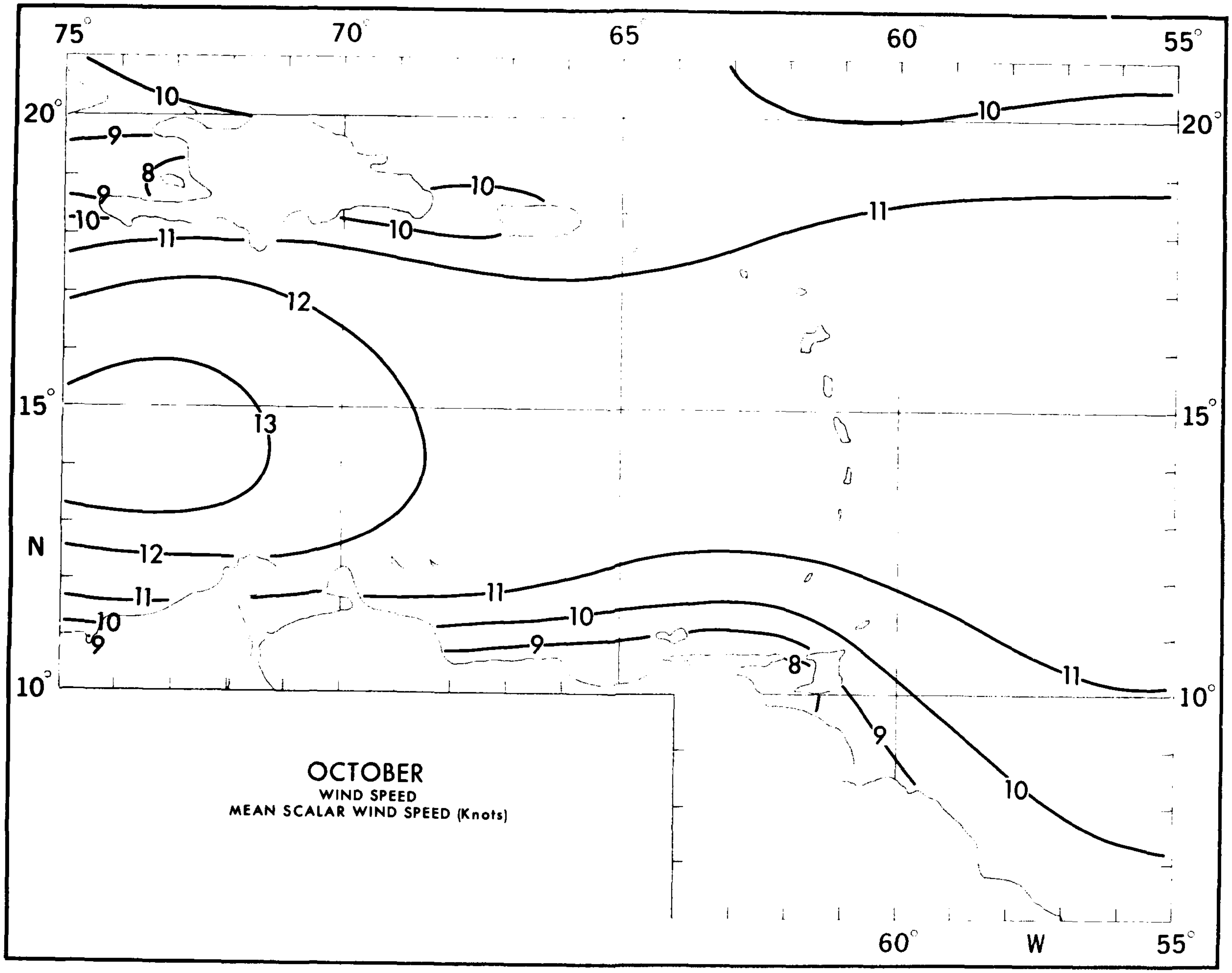


OCTOBER

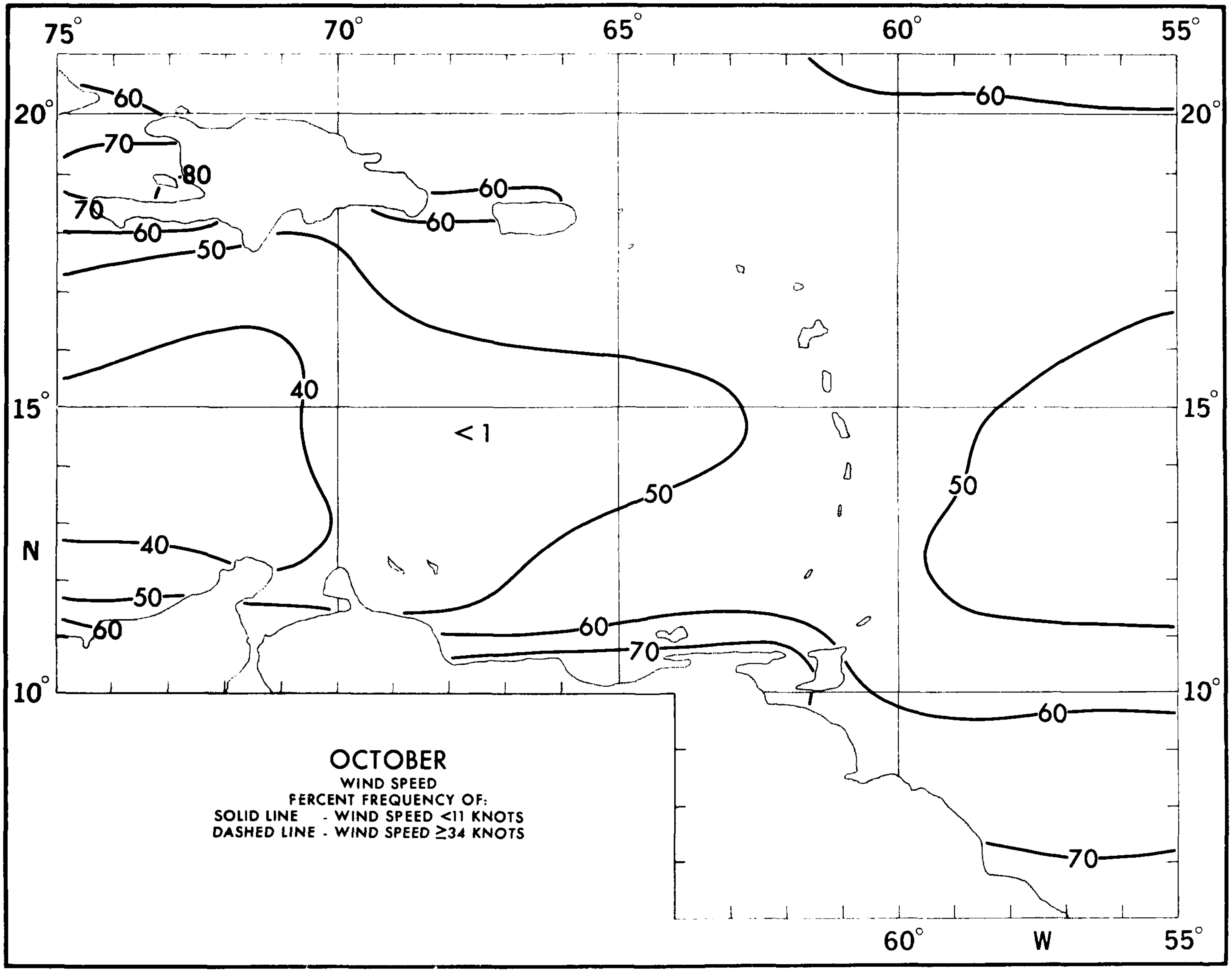
WIND-VISIBILITY-CLOUDINESS

SOLID LINE - PERCENT FREQUENCY OF OPTIMUM CONDITIONS: LCC ≥5000 FT., (OR NO LCC), VSBY. ≥5 N. MI. AND WIND 11-21 KTS.

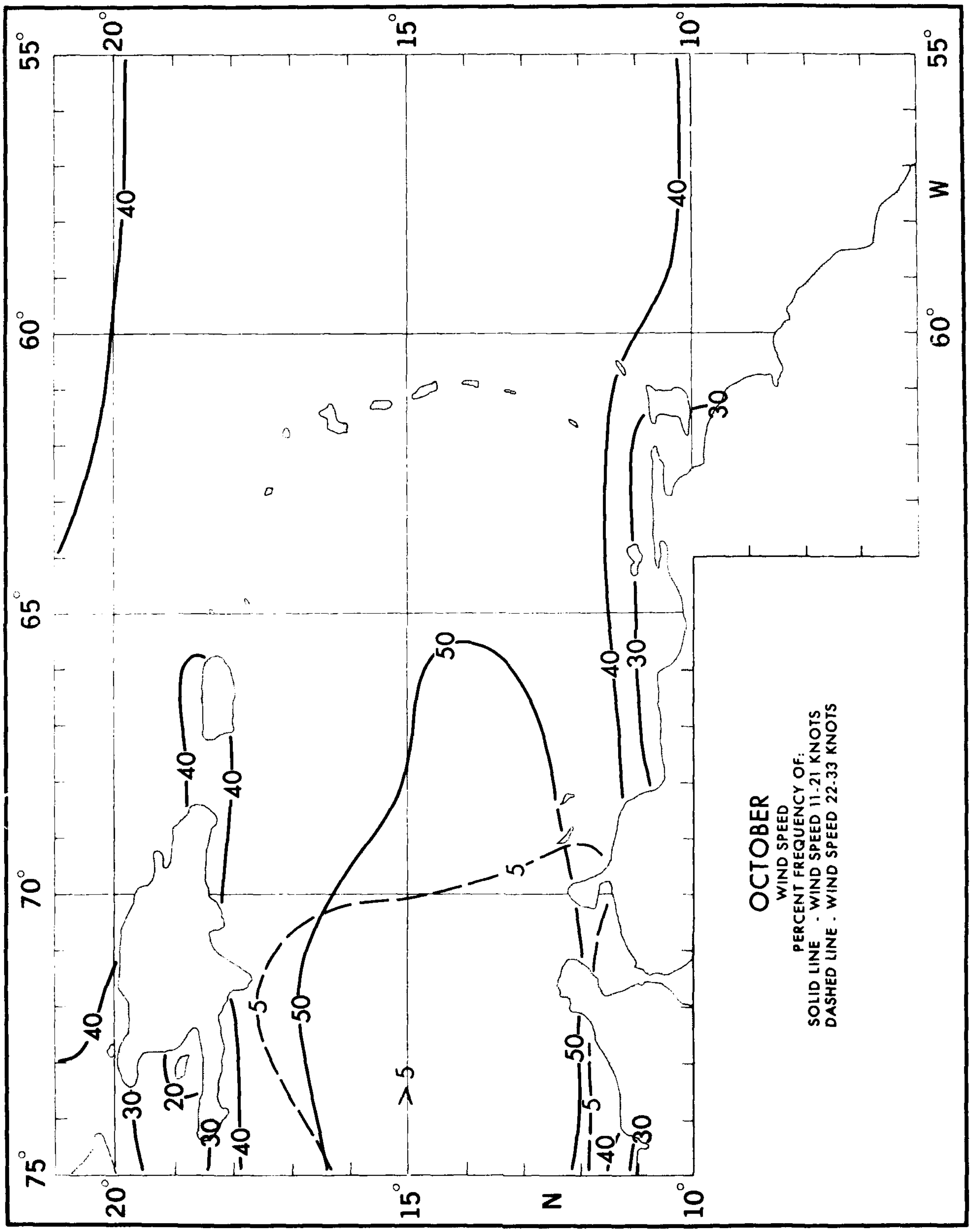
DASHED LINE - PERCENT FREQUENCY OF POOR CONDITIONS. ANY ONE OF THE FOLLOWING CONSTITUTES POOR CONDITIONS: LCC <300 FT., VSBY. <1 N. MI., WIND <6 OR ≥34 KTS.

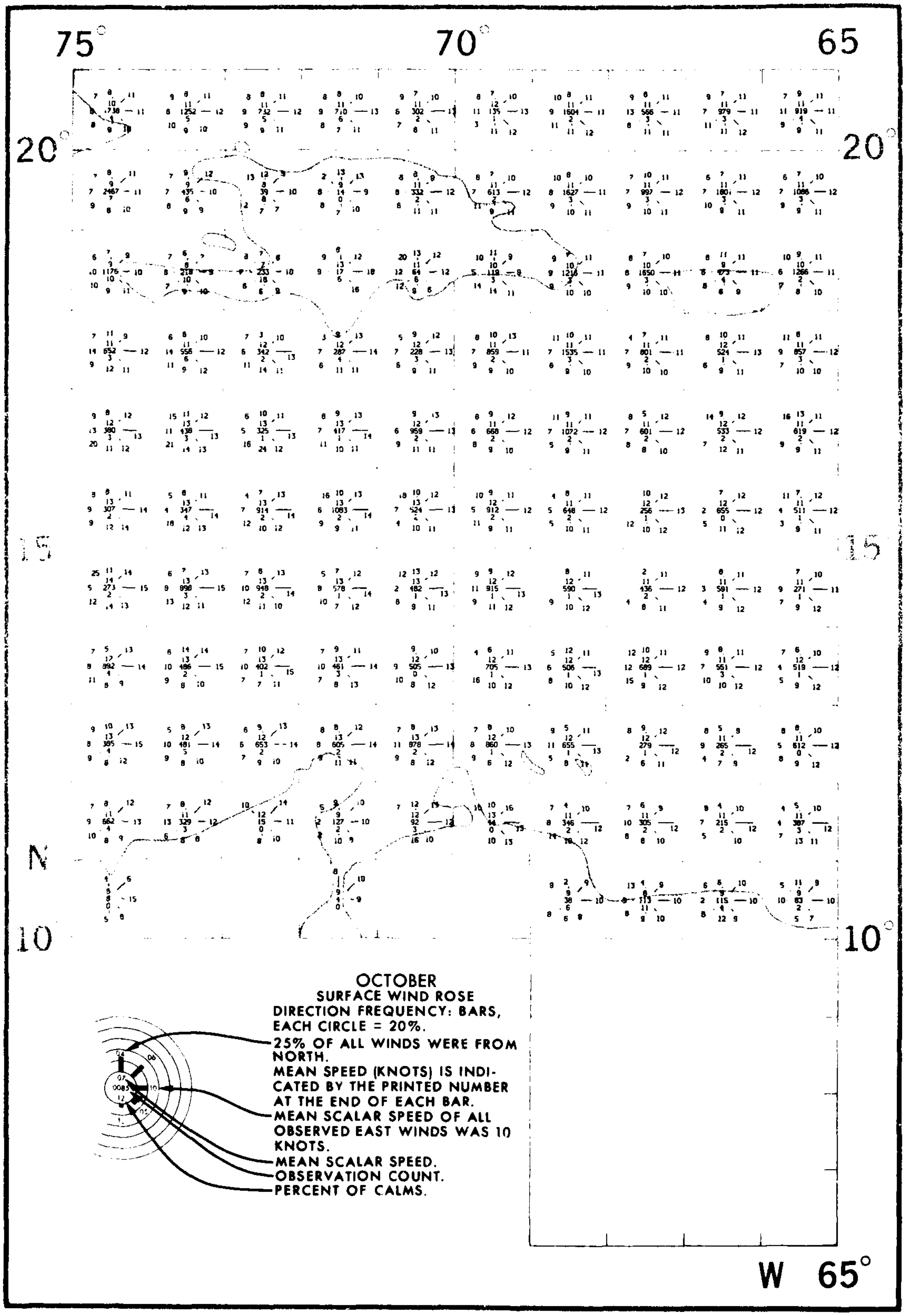


OCTOBER
WIND SPEED
MEAN SCALAR WIND SPEED (Knots)

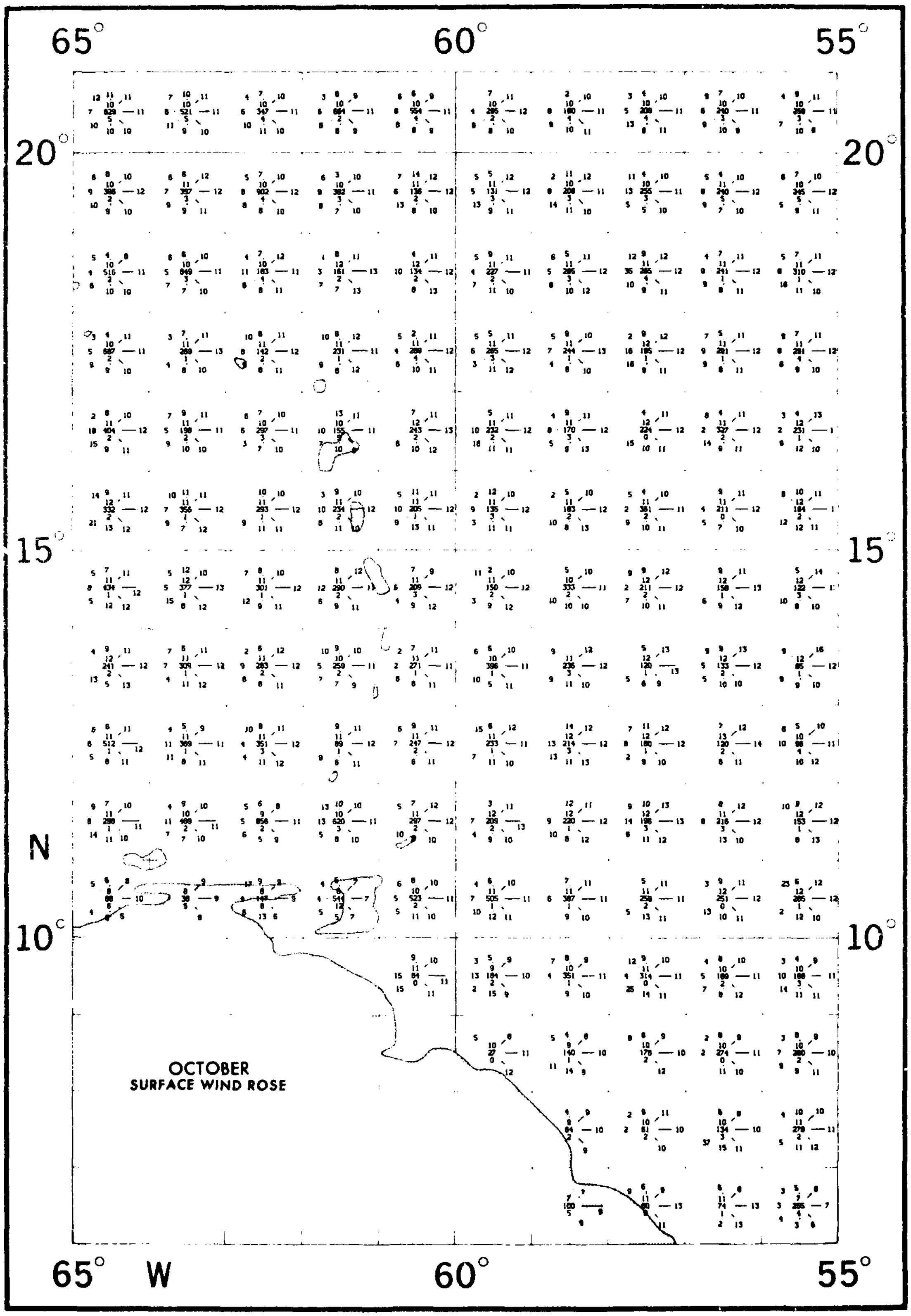


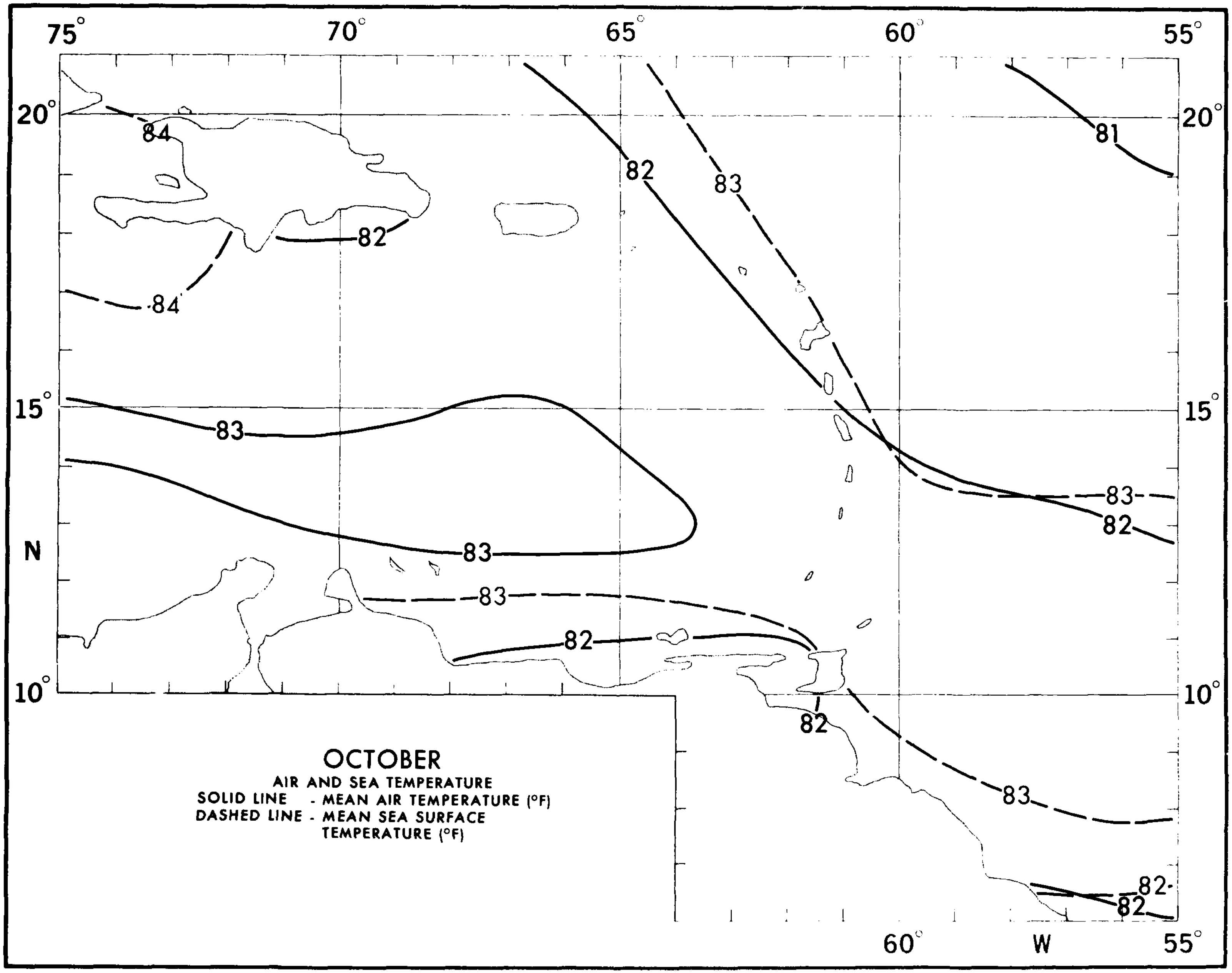
75°
70°
65°
60°
55°
20°
15°
10°
N
W
60
70
80
50
40
< 1
OCTOBER
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE - WIND SPEED <11 KNOTS
DASHED LINE - WIND SPEED ≥34 KNOTS

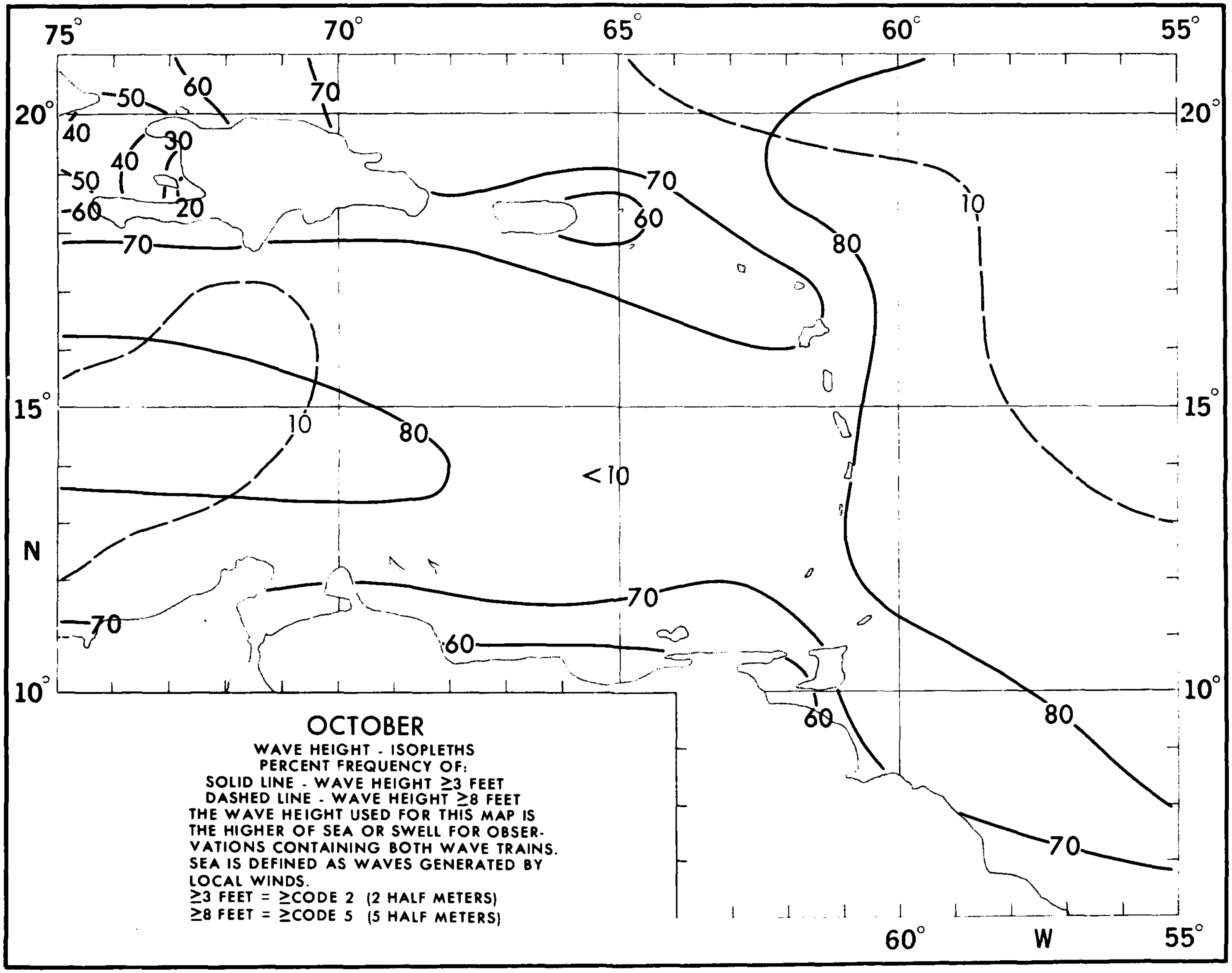

OCTOBER
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE - WIND SPEED 11-21 KNOTS
DASHED LINE . WIND SPEED 22-33 KNOTS
75°
70°
65°
60°
55°
20°
15°
10°
N
W
40
30
20
50
5
>5



OCTOBER
SURFACE WIND ROSE
DIRECTION FREQUENCY: BARS, EACH CIRCLE = 20%.
25% OF ALL WINDS WERE FROM NORTH.
MEAN SPEED (KNOTS) IS INDICATED BY THE PRINTED NUMBER AT THE END OF EACH BAR.
MEAN SCALAR SPEED OF ALL OBSERVED EAST WINDS WAS 10 KNOTS.
MEAN SCALAR SPEED.
OBSERVATION COUNT.
PERCENT OF CALMS.

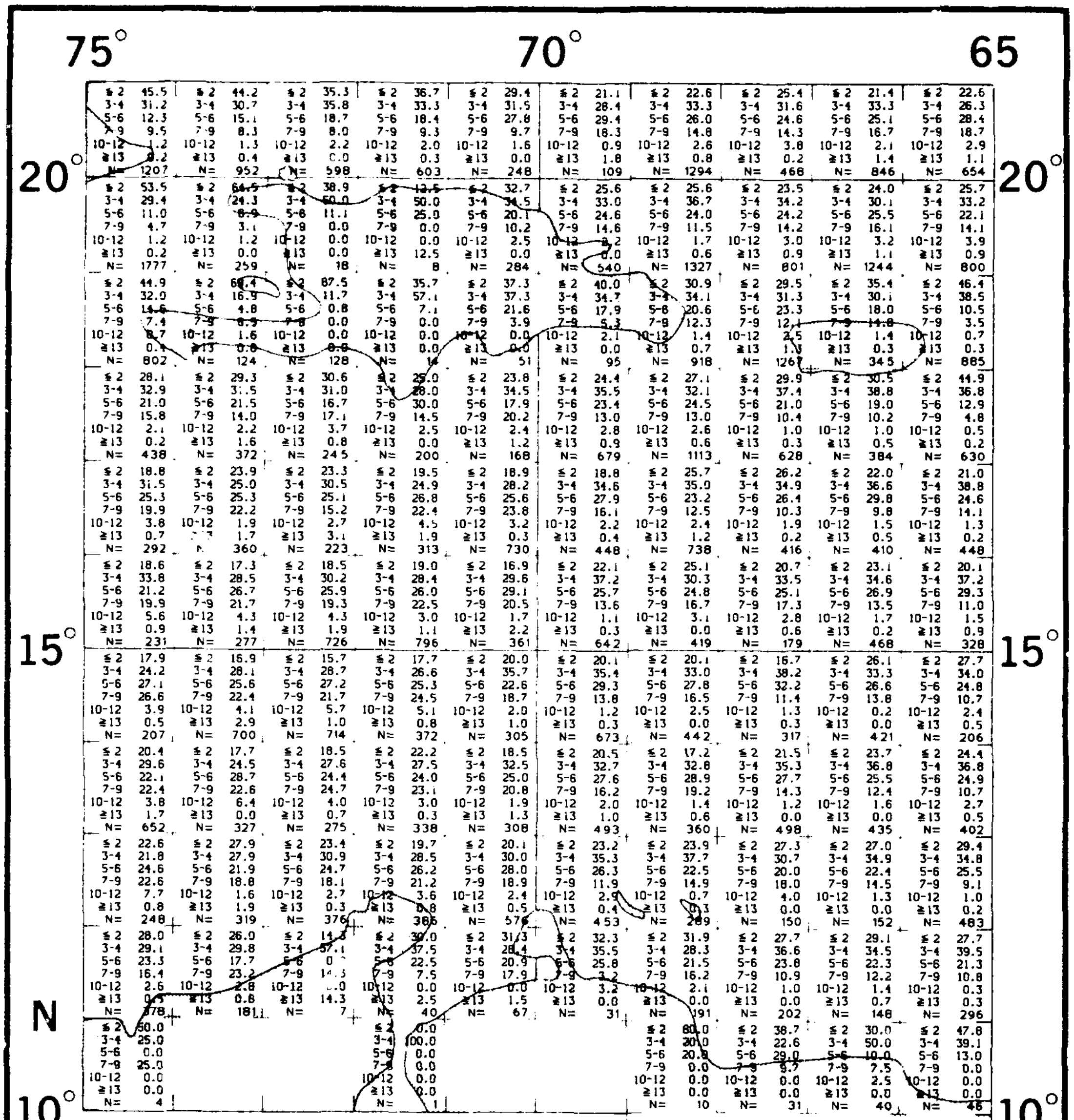

65°
60°
55°
20°
20°
15°
15°
N
10°
10°
OCTOBER
SURFACE WIND ROSE
65° W
60°
55°


OCTOBER
AIR AND SEA TEMPERATURE
SOLID LINE - MEAN AIR TEMPERATURE (°F)
DASHED LINE - MEAN SEA SURFACE TEMPERATURE (°F)
75° 70° 65° 60° 55°
20° 15° 10°
N
W
60° 55°
84
84
82
83
83
82
83
83
82
82
81
83
82
83
82
82



OCTOBER

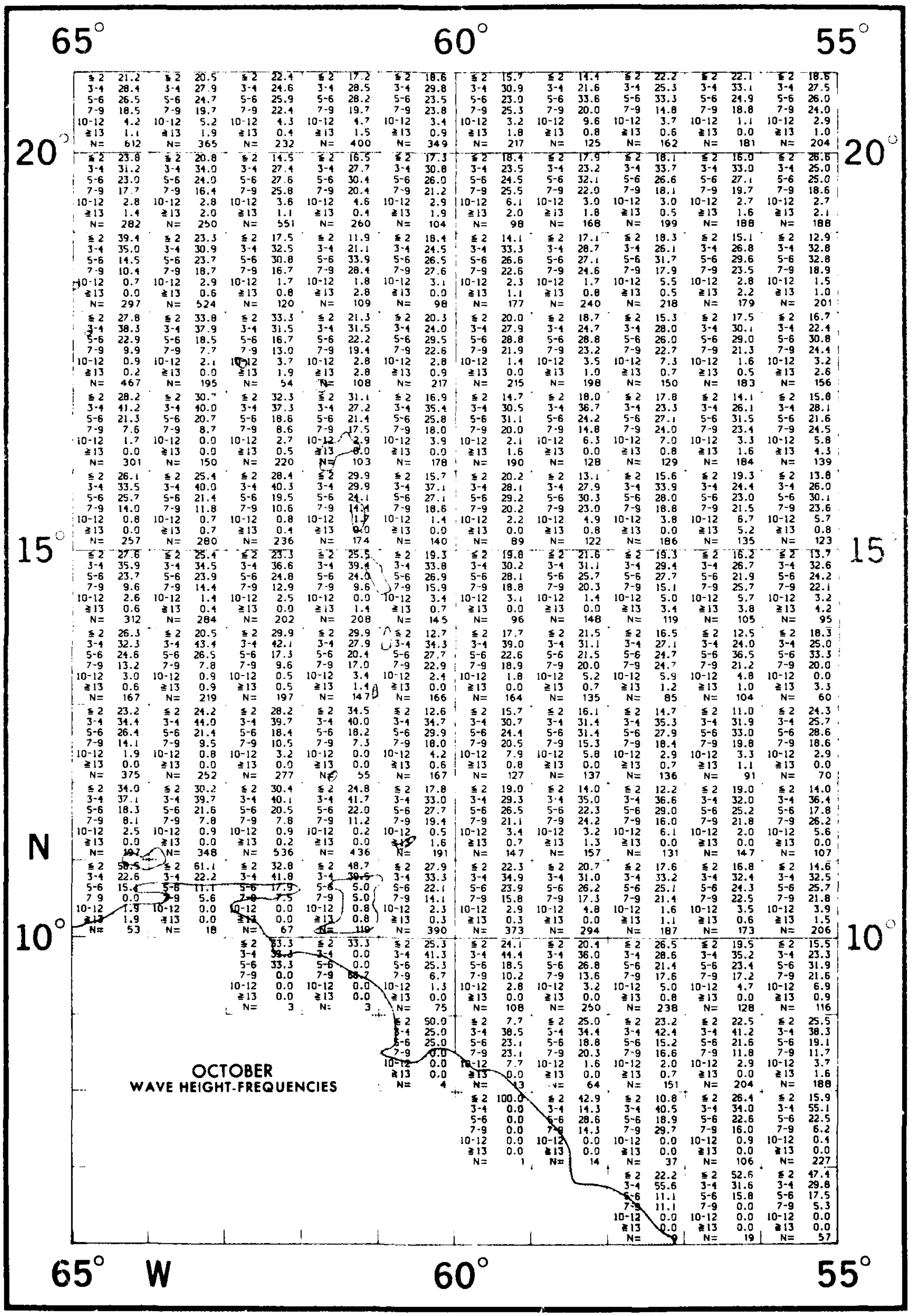
WAVE HEIGHT - ISOPLETHS
PERCENT FREQUENCY OF:
SOLID LINE - WAVE HEIGHT ≥3 FEET
DASHED LINE - WAVE HEIGHT ≥8 FEET
THE WAVE HEIGHT USED FOR THIS MAP IS THE HIGHER OF SEA OR SWELL FOR OBSERVATIONS CONTAINING BOTH WAVE TRAINS. SEA IS DEFINED AS WAVES GENERATED BY LOCAL WINDS.
≥3 FEET = ≥CODE 2 (2 HALF METERS)
≥8 FEET = ≥CODE 5 (5 HALF METERS)

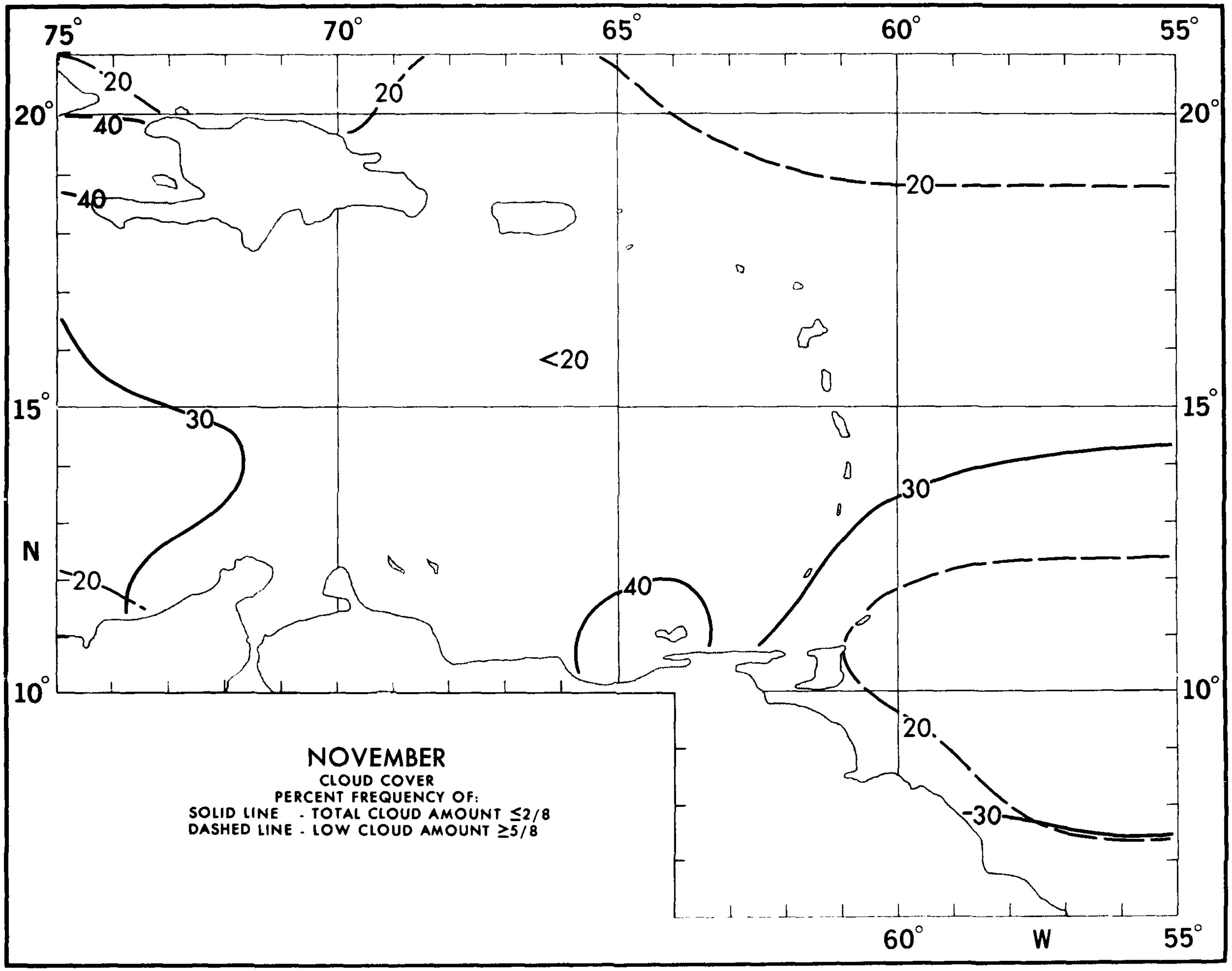


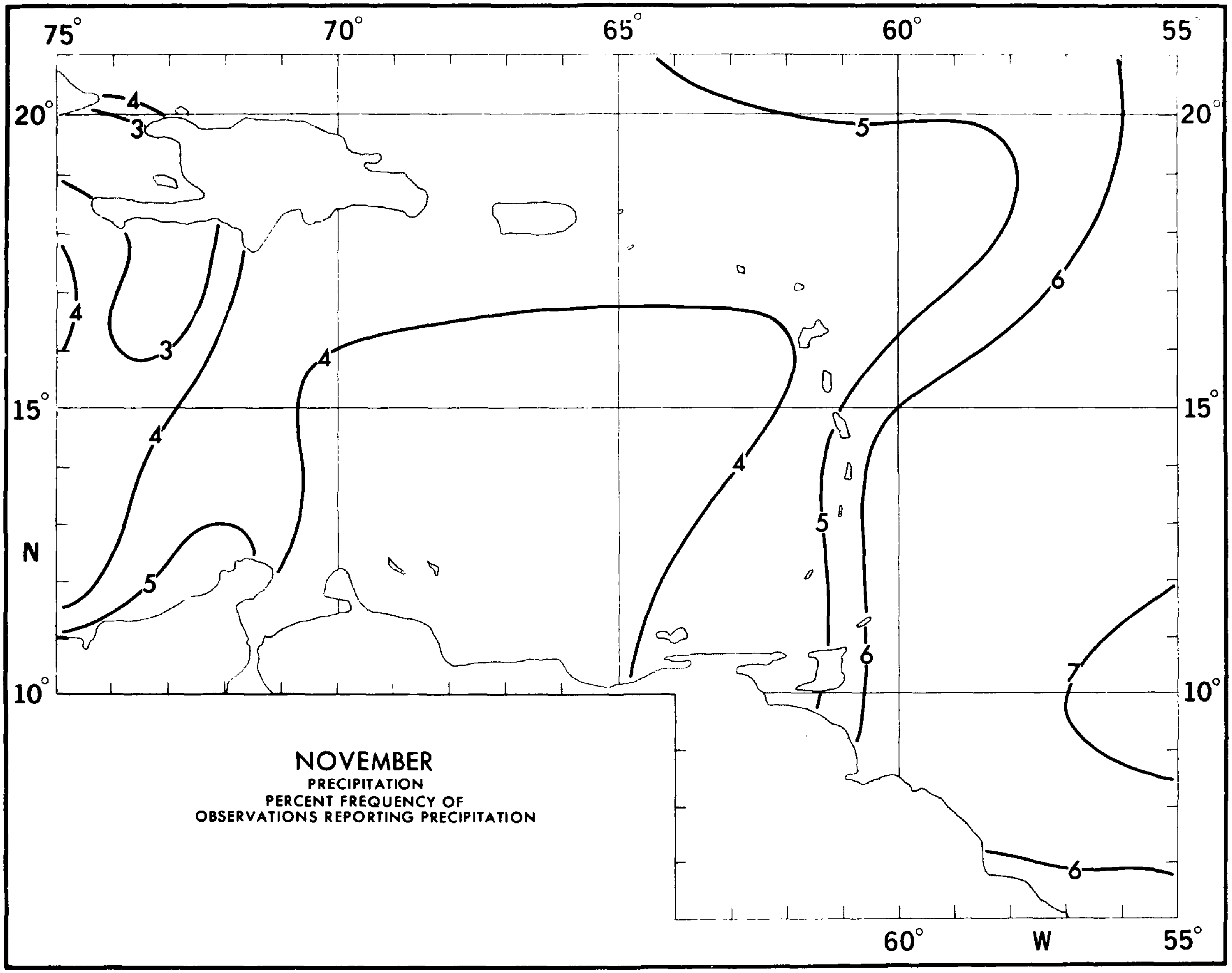
OCTOBER
WAVE HEIGHT-FREQUENCIES

≤2 10.0
3-4 20.0
5-6 30.0
7-9 20.0
10-12 10.0
≥13 10.0
N = 1363

PERCENT FREQUENCY OF VARIOUS RANGES WITHIN ONE-DEGREE QUADRANGLES.
EXAMPLE:
30.0% OF ALL OBSERVED WAVE HEIGHTS WERE IN THE RANGE 5 TO 6 FEET.
N = OBSERVATION COUNT.
WAVE DATA FOR THESE TABLES WERE SELECTED FROM THE HIGHER OF SEA OR SWELL WHEN BOTH WERE REPORTED.


65°
60°
55°
20°
15°
10°
N
W
OCTOBER
WAVE HEIGHT-FREQUENCIES


75°
70°
65°
60°
55°
20°
15°
10°
N
W
20
40
30
<20
NOVEMBER
CLOUD COVER
PERCENT FREQUENCY OF:
SOLID LINE - TOTAL CLOUD AMOUNT ≤2/8
DASHED LINE - LOW CLOUD AMOUNT ≥5/8



NOVEMBER
PRECIPITATION
PERCENT FREQUENCY OF
OBSERVATIONS REPORTING PRECIPITATION

75° 70° 65

20°

<.5	0.1	0.1	0.1	0.2	0.0	0.0	0.1	0.2	0.1	0.1
.5<1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
1<2	0.2	0.2	0.1	0.2	0.3	0.0	0.1	0.2	0.1	0.1
2<5	1.1	1.8	1.4	0.9	1.2	0.0	0.2	0.2	0.4	0.5
5<10	9.9	10.6	9.3	9.6	11.2	6.8	6.1	7.7	7.8	7.1
≥10	88.6	87.3	89.0	89.1	87.2	93.2	93.5	91.8	91.5	92.0
N=	1600	1154	708	633	329	103	1516	522	896	850
<.5	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0
.5<1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
1<2	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
2<5	0.7	1.1	5.0	0.0	0.9	0.7	0.8	0.3	0.6	0.7
5<10	11.5	16.5	52.5	14.3	12.7	8.4	5.5	8.2	7.5	8.0
≥10	87.6	82.1	42.5	85.7	86.4	90.8	93.8	91.5	91.7	91.3
N=	2349	351	40	7	331	586	1571	943	1354	1003
<.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0
.5<1	0.1	0.0	0.0	0.0	0.0	0.6	0.1	0.1	0.0	0.0
1<2	0.2	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.1
2<5	1.0	0.0	0.5	0.0	0.0	0.6	1.2	0.6	0.4	0.5
5<10	6.4	11.6	35.1	14.3	8.3	22.0	6.7	8.7	33.7	25.3
≥10	92.4	88.4	64.4	85.7	91.7	76.8	91.7	90.6	65.7	74.1
N=	1021	155	208	7	24	164	1021	1440	495	1343
<.5	0.0	0.0	0.4	0.0	0.0	0.0	0.1	0.2	0.0	0.1
.5<1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.8	0.4
1<2	0.2	0.2	0.0	0.0	0.0	0.3	0.1	0.2	0.0	0.1
2<5	0.6	0.7	0.0	0.5	0.0	1.0	0.9	0.5	1.6	0.7
5<10	11.2	8.6	9.1	12.6	13.1	12.4	7.2	8.7	9.2	20.0
≥10	88.0	90.6	90.6	86.9	86.9	86.2	91.7	90.5	88.3	78.5
N=	517	456	276	198	221	715	1398	656	368	669
<.5	0.0	0.0	0.0	0.0	0.2	0.0	0.2	0.0	0.0	0.0
.5<1	0.0	0.0	0.0	0.3	0.1	0.0	0.0	0.0	0.0	0.0
1<2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0
2<5	0.0	0.8	0.0	0.9	0.5	0.4	1.0	0.4	0.7	0.6
5<10	4.7	6.1	4.7	8.7	8.9	10.4	7.7	7.7	5.9	10.7
≥10	95.3	93.0	95.3	90.1	90.2	89.3	90.9	91.9	93.4	88.7
N=	338	358	253	335	820	559	831	468	423	523
<.5	0.4	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.5	0.2
.5<1	0.7	0.0	0.0	0.0	0.0	0.0	0.2	0.5	0.0	0.0
1<2	0.0	0.0	0.3	0.4	0.0	0.0	0.0	0.0	0.4	0.0
2<5	0.7	0.4	0.6	0.9	0.8	0.7	1.3	0.0	0.5	0.9
5<10	5.7	4.9	6.4	7.8	6.8	7.8	5.4	10.1	10.0	12.4
≥10	92.5	94.8	92.7	90.8	92.4	91.6	92.9	89.4	88.5	86.4
N=	279	268	779	933	382	722	535	207	550	442

15° 15°

<.5	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.3	0.4	0.0
.5<1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1<2	0.4	0.1	0.4	0.0	0.3	0.0	0.0	0.0	0.0	0.0
2<5	1.2	0.4	0.7	0.9	0.3	0.4	0.8	0.0	1.2	0.4
5<10	6.9	9.6	7.1	7.6	10.7	5.1	5.9	7.6	6.6	5.7
≥10	91.5	89.8	91.8	91.5	88.7	94.3	93.3	92.1	91.8	93.9
N=	259	768	708	422	337	759	506	329	512	245
<.5	0.1	0.0	0.0	0.3	0.0	0.2	0.0	0.0	0.4	0.0
.5<1	0.0	0.3	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0
1<2	0.0	0.0	0.3	0.3	0.0	0.2	0.0	0.2	0.2	0.0
2<5	1.0	0.9	0.6	0.0	0.5	1.0	0.5	0.7	0.0	0.3
5<10	9.3	10.6	8.7	5.6	6.6	6.1	5.9	7.2	4.9	4.2
≥10	89.5	88.2	90.4	93.8	92.6	92.6	93.6	91.9	94.5	95.5
N=	774	340	311	321	376	592	393	594	532	354
<.5	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0
.5<1	0.0	0.5	0.0	0.2	0.3	0.2	0.0	0.0	0.0	0.0
1<2	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.4	0.0	0.2
2<5	0.7	0.8	0.3	0.9	0.4	0.5	0.6	0.0	0.0	0.2
5<10	13.3	14.1	14.0	10.6	8.5	12.1	10.3	7.3	6.8	5.6
≥10	86.0	84.6	85.7	88.3	90.7	86.8	88.7	92.3	93.2	94.0
N=	301	383	580	556	691	637	486	234	190	531
<.5	0.3	0.0	0.0	0.0	0.0	1.9	0.0	0.0	0.0	0.0
.5<1	0.5	0.4	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.3
1<2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
2<5	0.3	0.8	0.0	0.0	0.0	1.9	1.1	1.7	3.2	0.5
5<10	13.6	16.0	0.0	9.3	6.7	46.3	8.6	5.0	10.0	6.3
≥10	85.0	82.8	100.0	90.7	93.3	50.0	89.8	93.3	86.8	92.6
N=	581	244	9	54	75	54	266	240	190	364
<.5	0.0			0.0			0.0	0.0	0.0	0.0
.5<1	0.0			0.0			4.2	4.3	1.4	1.3
1<2	0.0			0.0			0.0	0.0	0.0	0.0
2<5	0.0			0.0			4.2	0.0	2.8	0.0
5<10	33.3			10.0			20.8	25.7	15.3	13.2
≥10	66.7			90.0			70.8	70.0	80.6	85.5
N=	3			10			24	70	72	76

N

10° 10°

NOVEMBER

VISIBILITY (NAUTICAL MILES)

<.5	.2
.5 <1	3.1
1 <2	6.7
2 <5	10.0
5 <10	60.0
≥10	20.0
N =	1234

PERCENT FREQUENCY OF VARIOUS RANGES WITHIN ONE-DEGREE QUADRANGLES.
EXAMPLE:
3.1% OF THE OBSERVED VISIBILITIES WERE <1 BUT ≥1/2 N. MILE.
OTHER PERCENTAGES CAN BE SIMILARLY INTERPRETED.
N = OBSERVATION COUNT.

W 65°

65° 60° 55°

<.5	0.0	0.2	0.7	0.2	0.0	0.0	0.5	0.5	0.0	0.4
.5<1	0.3	0.6	0.3	0.0	0.0	0.4	0.0	0.0	0.0	0.0
1<2	0.1	0.2	0.0	0.0	0.4	0.7	0.0	0.0	0.0	0.0
2<5	0.8	0.6	1.7	1.2	0.2	0.0	0.0	0.5	1.6	3.0
5<10	9.9	8.6	8.0	11.5	6.7	10.0	10.3	10.3	4.9	3.8
≥10	88.9	89.7	89.2	87.1	92.7	88.9	89.2	88.7	93.4	92.7
N=	748	464	287	512	491	280	185	195	244	234

20° 20°

<.5	0.5	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
.5<1	0.0	0.0	0.3	0.5	0.0	0.0	0.0	0.4	0.0	0.0
1<2	0.0	0.7	0.3	0.5	0.0	0.0	0.0	0.4	0.9	0.5
2<5	0.5	1.0	0.1	0.5	0.6	1.5	1.0	0.4	2.7	1.9
5<10	12.8	5.0	9.3	9.7	8.5	10.0	7.0	8.7	9.4	8.5
≥10	86.1	93.4	90.0	88.5	90.9	88.5	92.0	90.1	87.1	89.2
N=	367	301	698	401	165	130	201	242	224	212

<.5	0.2	0.1	0.5	0.6	0.0	0.0	0.0	0.0	0.0	0.0
.5<1	0.0	0.1	0.0	1.8	0.0	0.0	0.3	0.0	0.0	0.4
1<2	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2<5	0.0	0.8	1.4	0.0	0.0	0.4	0.7	1.2	0.9	0.8
5<10	50.3	7.3	7.3	13.9	9.2	9.4	4.6	5.9	12.4	10.5
≥10	49.0	91.5	90.8	83.6	90.8	90.2	94.4	92.9	86.7	88.3
N=	628	763	218	165	142	245	305	253	226	257

<.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
.5<1	0.9	0.8	0.0	2.2	0.0	0.0	0.0	0.5	0.0	0.4
1<2	0.2	0.0	0.9	0.0	0.0	0.4	0.0	0.0	0.4	0.4
2<5	0.9	1.3	0.9	1.4	1.6	1.8	1.6	2.2	0.8	2.2
5<10	10.9	8.4	36.8	16.7	7.1	9.6	9.4	10.8	7.1	10.4
≥10	87.0	89.5	61.4	79.7	91.3	88.3	88.9	86.6	91.6	86.7
N=	576	239	114	138	309	282	244	186	239	278

<.5	0.0	1.2	0.0	0.0	0.0	0.5	0.0	0.0	0.4	0.0
.5<1	0.0	0.0	0.3	1.0	1.8	0.0	0.5	0.5	0.0	0.0
1<2	0.3	0.0	0.0	0.0	0.0	0.9	0.5	0.5	0.8	0.0
2<5	0.0	0.6	0.0	0.5	0.9	0.9	2.7	0.0	0.8	0.4
5<10	5.4	4.8	12.7	10.1	8.6	6.6	9.2	8.9	9.8	9.7
≥10	94.3	93.5	86.9	88.5	88.7	91.0	87.0	90.1	88.3	89.8
N=	371	168	314	208	221	212	184	192	266	236

<.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.5	0.0
.5<1	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0
1<2	0.0	0.3	0.0	0.4	0.0	0.0	0.0	0.4	0.0	0.0
2<5	1.0	0.9	0.4	0.0	1.0	1.7	0.6	0.7	0.9	0.0
5<10	8.9	3.8	6.8	12.1	18.4	12.6	9.3	11.6	16.2	10.4
≥10	89.7	95.0	92.8	87.5	80.1	85.7	90.1	87.0	82.4	89.6
N=	291	339	251	240	201	119	172	276	216	163

15° 15°

<.5	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.6	0.0
.5<1	0.0	0.0	0.0	0.4	1.8	0.0	0.0	0.0	0.0	0.0
1<2	0.3	0.3	0.4	0.8	0.0	0.0	0.0	0.0	0.0	0.0
2<5	0.5	0.9	0.4	0.4	1.8	1.7	1.6	0.6	1.8	0.0
5<10	9.1	9.3	15.9	11.8	14.7	18.3	14.5	13.9	10.8	5.6
≥10	90.1	89.5	83.3	87.1	81.6	80.0	83.9	85.6	86.8	94.4
N=	384	334	276	263	163	115	249	180	167	126

<.5	0.0	0.0	0.0	0.0	0.0	0.3	0.0	1.0	0.0	0.0
.5<1	0.5	0.0	0.0	0.5	0.7	0.3	0.4	0.0	0.0	0.9
1<2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2<5	0.5	0.4	0.8	0.5	0.4	2.1	0.9	1.0	2.3	0.0
5<10	8.6	4.3	5.4	18.3	22.7	19.4	17.9	10.5	6.2	12.0
≥10	90.4	95.4	93.8	80.8	76.2	77.9	80.8	87.6	91.5	87.2
N=	209	280	240	219	282	330	229	105	129	117

<.5	0.0	0.0	0.0	0.5	0.5	0.0	0.0	0.0	0.0	0.0
.5<1	0.0	0.0	0.3	1.6	0.0	0.5	0.0	0.0	0.0	0.0
1<2	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
2<5	0.2	0.7	1.3	0.0	0.9	0.5	4.0	0.6	3.0	1.3
5<10	6.4	5.7	6.6	20.6	13.3	16.3	7.5	7.5	12.0	17.3
≥10	93.4	92.8	91.7	77.2	85.3	82.8	88.5	91.9	84.0	81.3
N=	425	279	302	189	218	221	174	161	100	75

N

<.5	0.0	0.3	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0
.5<1	0.8	0.8	0.3	0.2	0.0	0.5	0.0	0.4	0.0	0.0
1<2	0.0	0.3	0.0	0.2	0.0	0.0	0.0	0.4	0.0	0.0
2<5	0.4	0.0	1.1	1.6	2.1	1.6	1.1	0.8	0.6	0.0
5<10	11.0	9.2	6.4	13.8	12.7	17.7	17.2	13.7	12.6	10.9
≥10	87.9	89.5	92.2	83.7	85.2	80.1	81.7	84.6	86.8	89.1
N=	264	380	628	514	284	186	186	241	167	129

<.5	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0
.5<1	0.0	0.0	0.0	0.5	0.4	0.2	0.3	0.0	0.5	0.0
1<2	1.4	0.0	0.0	0.0	0.2	0.0	0.3	0.0	0.0	0.0
2<5	0.0	0.0	0.8	0.0	1.3	0.2	0.6	1.4	1.9	1.1
5<10	7.2	8.7	10.9	21.5	9.4	12.4	11.9	9.5	19.4	10.6
≥10	91.3	91.3	88.4	77.9	88.6	86.9	87.0	89.1	78.2	88.3
N=	69	23	129	106	466	436	353	211	216	282

10° 10°

<.5				0.0	0.0	0.0	0.3	0.7	0.0	0.0
.5<1				0.0	0.0	0.0	0.6	0.0	0.0	0.0
1<2				0.0	0.0	0.6	0.0	0.0	0.0	0.0
2<5				0.0	0.0	0.0	0.3	1.8	2.2	2.6
5<10				0.0	7.4	11.2	10.1	9.0	14.6	18.8
≥10				100.0	92.6	88.3	88.7	88.5	83.1	78.6
N=				2	54	179	326	279	178	117

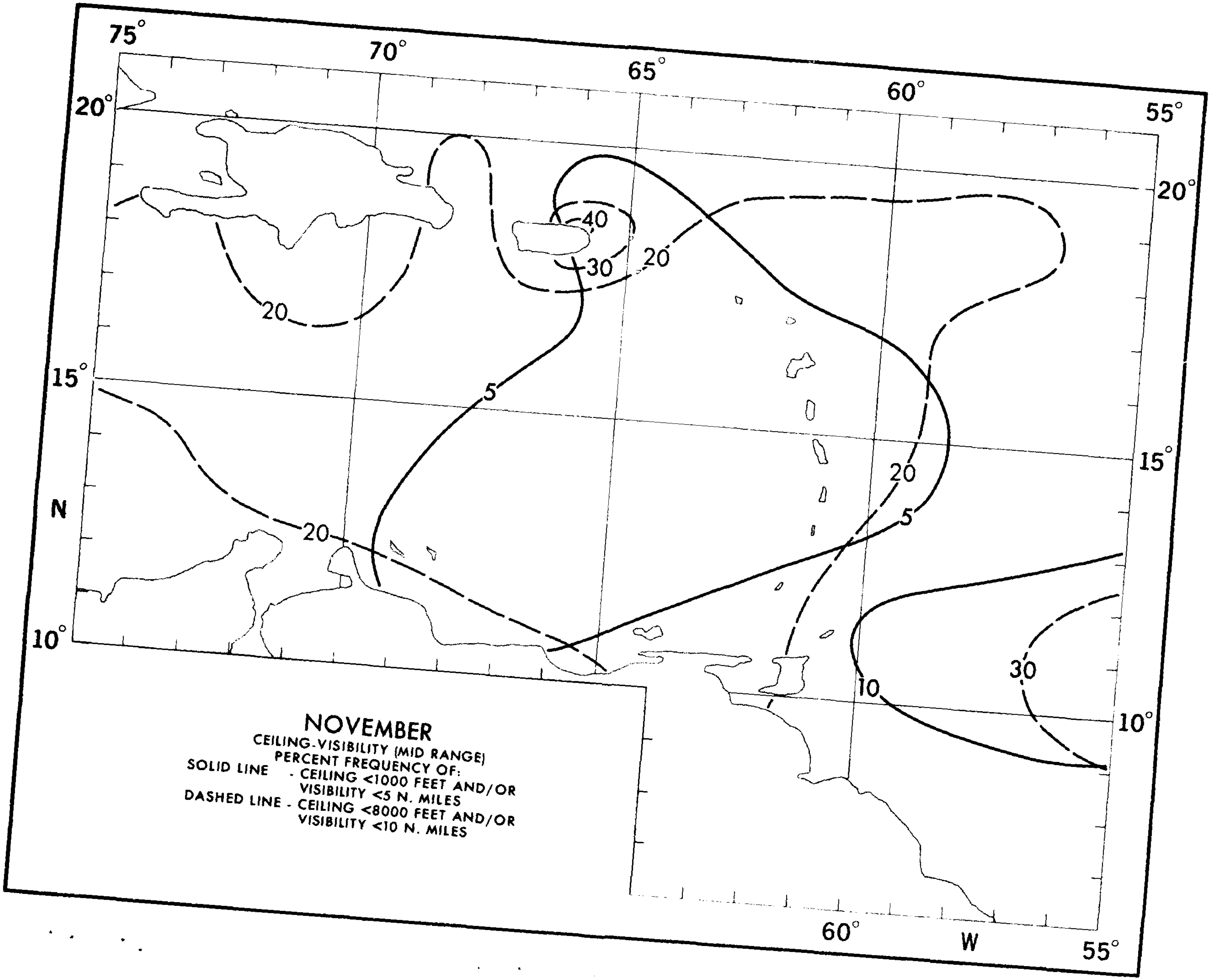
<.5					0.0	0.0	0.0	0.6	0.4	0.0
.5<1					0.0	0.0	0.9	0.0	0.0	0.0
1<2					0.0	0.0	0.0	0.0	0.0	0.5
2<5					0.0	0.0	0.0	0.6	2.0	0.5
5<10					0.0	0.0	17.2	8.9	10.8	14.2
≥10					100.0	100.0	81.9	89.9	86.9	84.9
N=					3	12	116	169	251	212

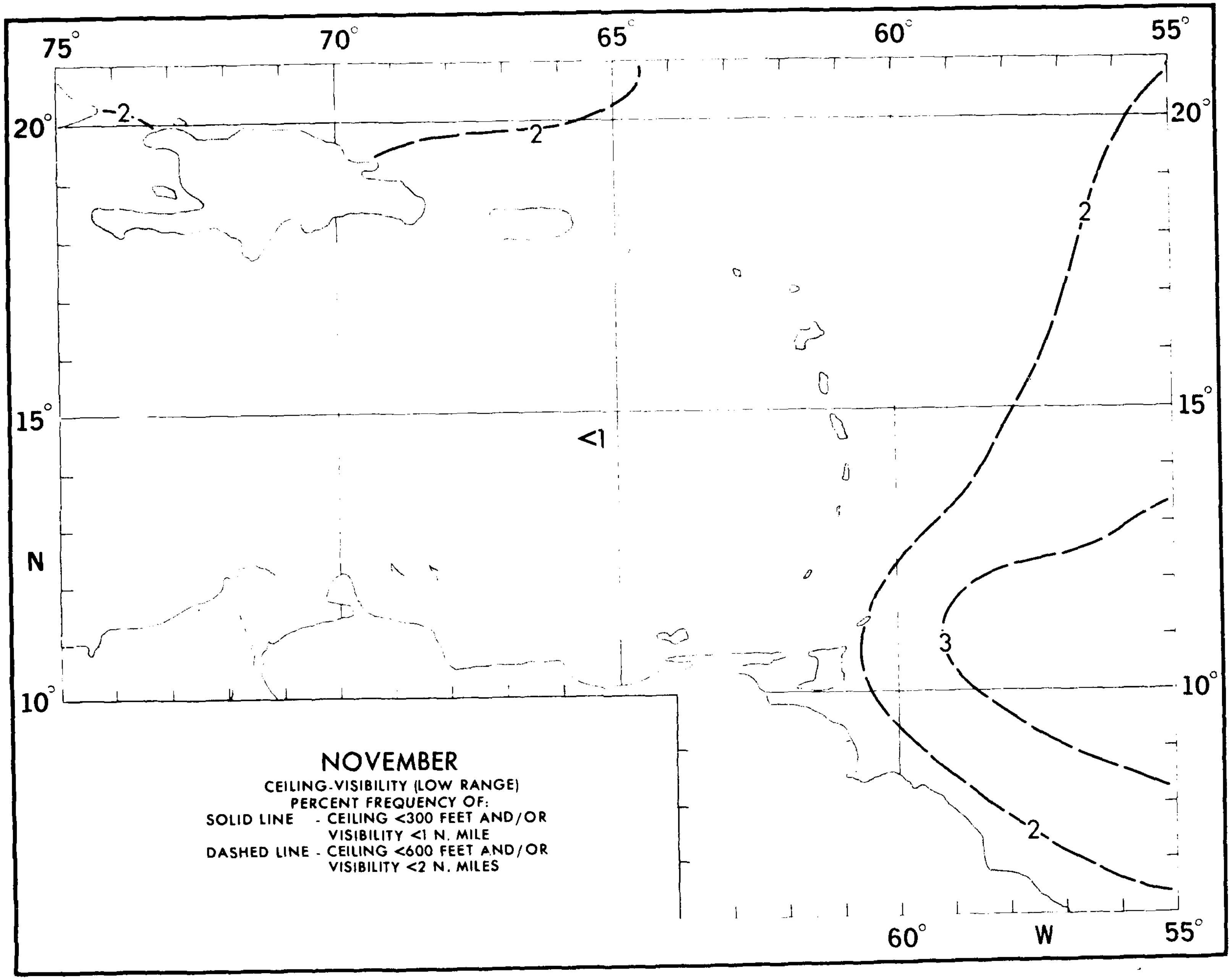
<.5						0.0	0.0	0.0	0.0	0.0
.5<1						0.0	3.8	0.0	0.0	0.0
1<2						0.0	0.0	2.9	0.0	0.0
2<5						100.0	0.0	0.0	0.0	0.0
5<10						0.0	32.1	11.8	35.6	14.1
≥10						0.0	64.2	85.3	64.4	85.9
N=						1	53	34	146	128

<.5							0.0	0.0	0.0	0.0
.5<1							7.1	11.1	3.4	1.0
1<2							0.0	0.0	0.0	0.0
2<5							0.0	0.0	0.0	2.0
5<10							64.3	25.9	23.7	10.9
≥10							28.6	63.0	72.9	86.1
N=							14	27	59	101

NOVEMBER
VISIBILITY (NAUTICAL MILES)

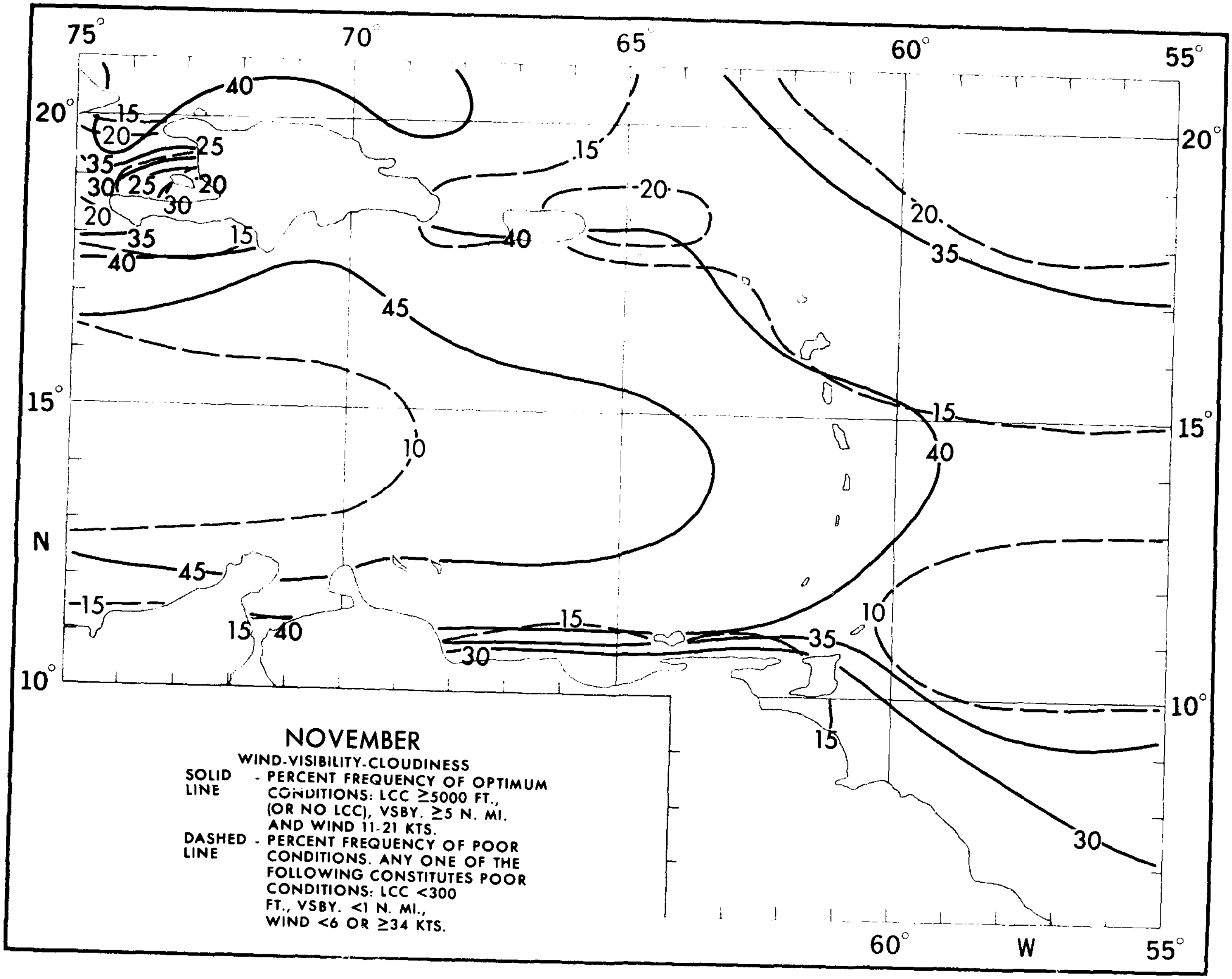
65° W 60° 55°

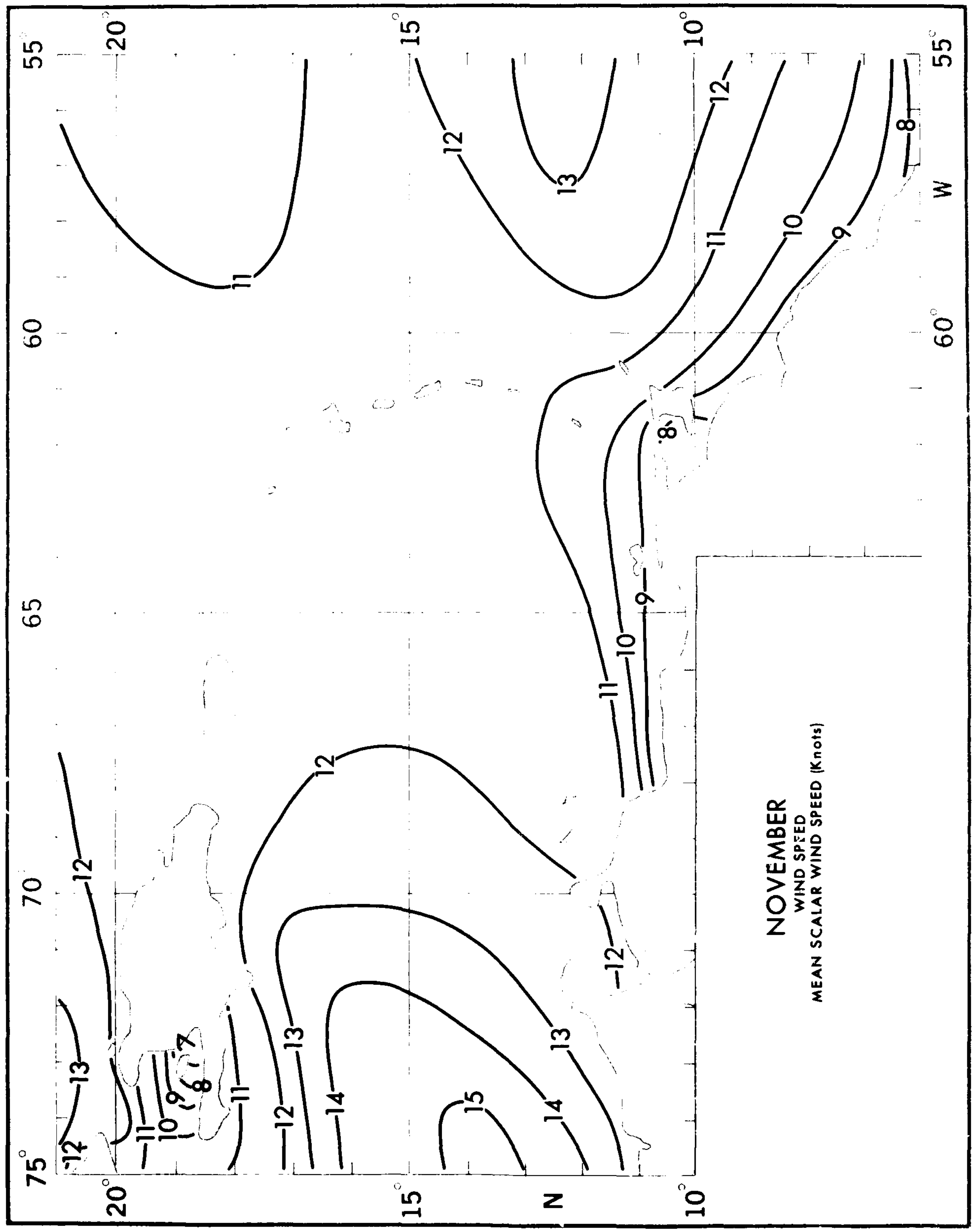

75°
70°
65°
60°
55°
20°
15°
10°
N
W
20
40
30
5
10
NOVEMBER
CEILING-VISIBILITY (MID RANGE)
PERCENT FREQUENCY OF:
SOLID LINE - CEILING <1000 FEET AND/OR VISIBILITY <5 N. MILES
DASHED LINE - CEILING <8000 FEET AND/OR VISIBILITY <10 N. MILES



NOVEMBER

CEILING-VISIBILITY (LOW RANGE)
PERCENT FREQUENCY OF:
SOLID LINE - CEILING <300 FEET AND/OR VISIBILITY <1 N. MILE
DASHED LINE - CEILING <600 FEET AND/OR VISIBILITY <2 N. MILES

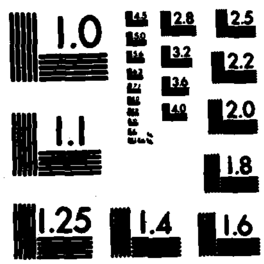

NOVEMBER
WIND-VISIBILITY-CLOUDINESS
SOLID LINE - PERCENT FREQUENCY OF OPTIMUM CONDITIONS: LCC ≥5000 FT., (OR NO LCC), VSBY. ≥5 N. MI. AND WIND 11-21 KTS.
DASHED LINE - PERCENT FREQUENCY OF POOR CONDITIONS. ANY ONE OF THE FOLLOWING CONSTITUTES POOR CONDITIONS: LCC <300 FT., VSBY. <1 N. MI., WIND <6 OR ≥34 KTS.
75°
70°
65°
60°
55°
20°
15°
10°
N
W

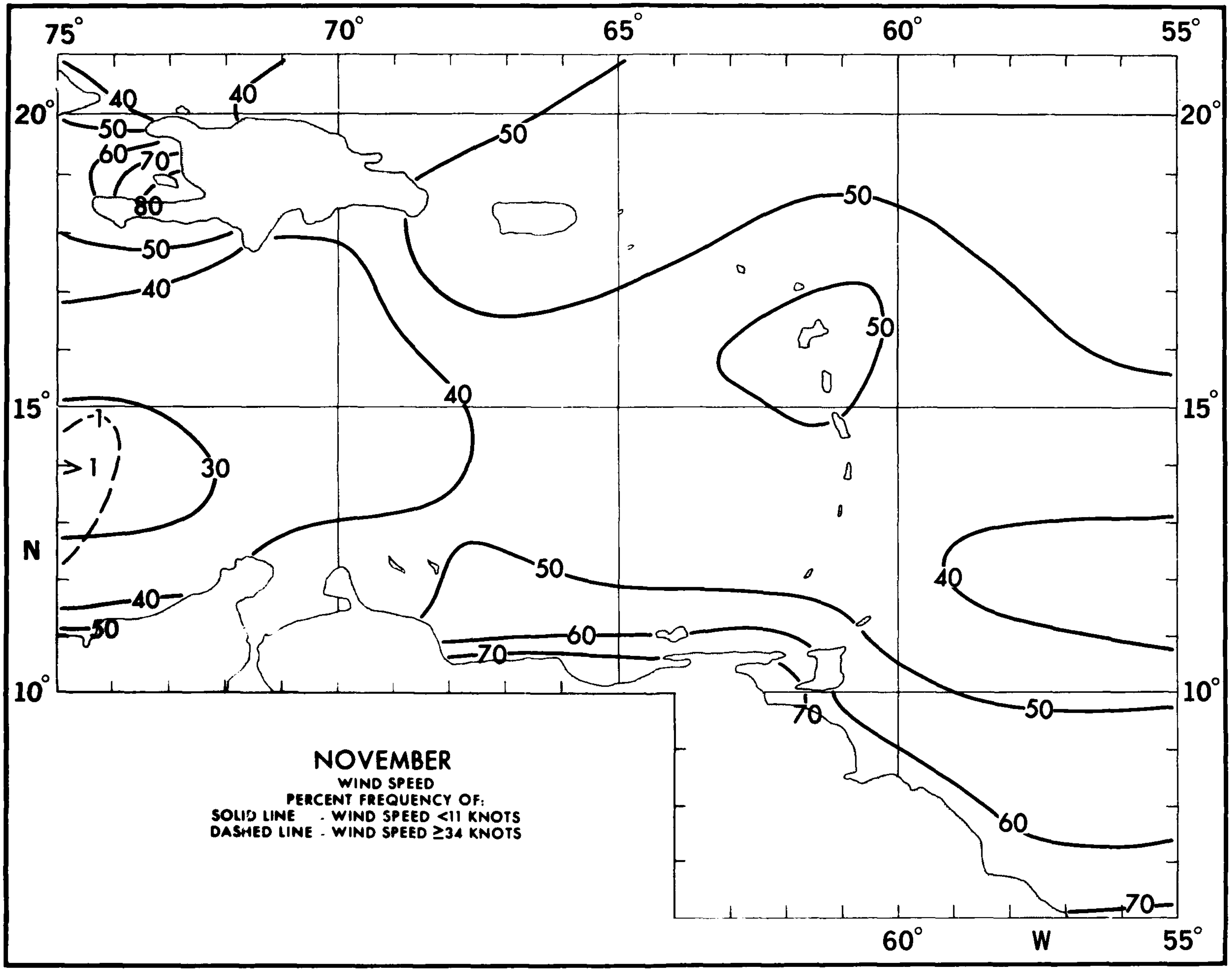

NOVEMBER
WIND SPEED
MEAN SCALAR WIND SPEED (Knots)

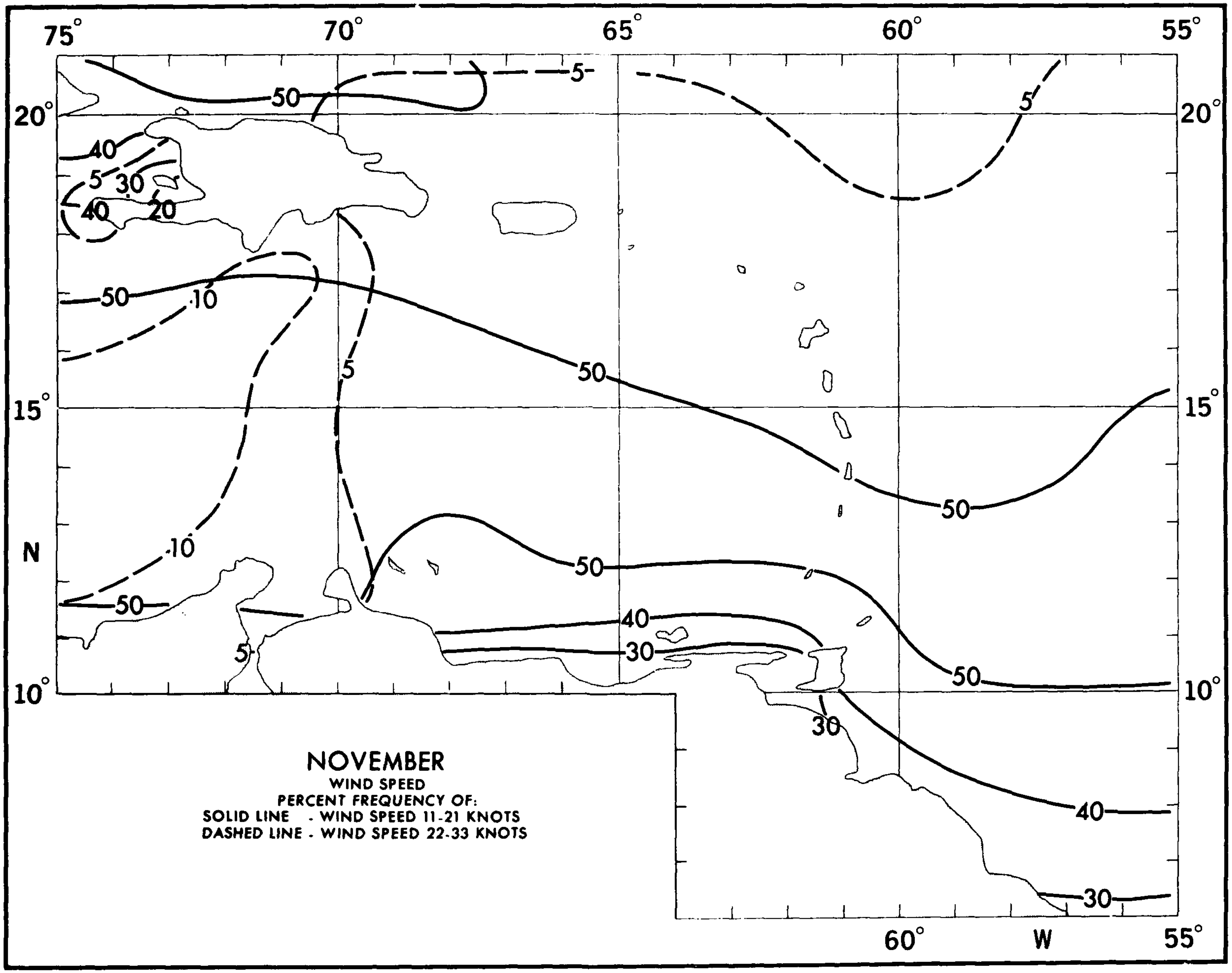
AD-A171 487 US NAVY CLIMATIC STUDY OF THE CARIBBEAN SEA AND GULF OF MEXICO VOLUME 2 EAST CARIBBEAN SEA(U) NAVAL AIR SYSTEMS COMMAND WASHINGTON DC MAR 86 NAVAIR-50-1C-544 3/3

UNCLASSIFIED F/G 4/2 NL

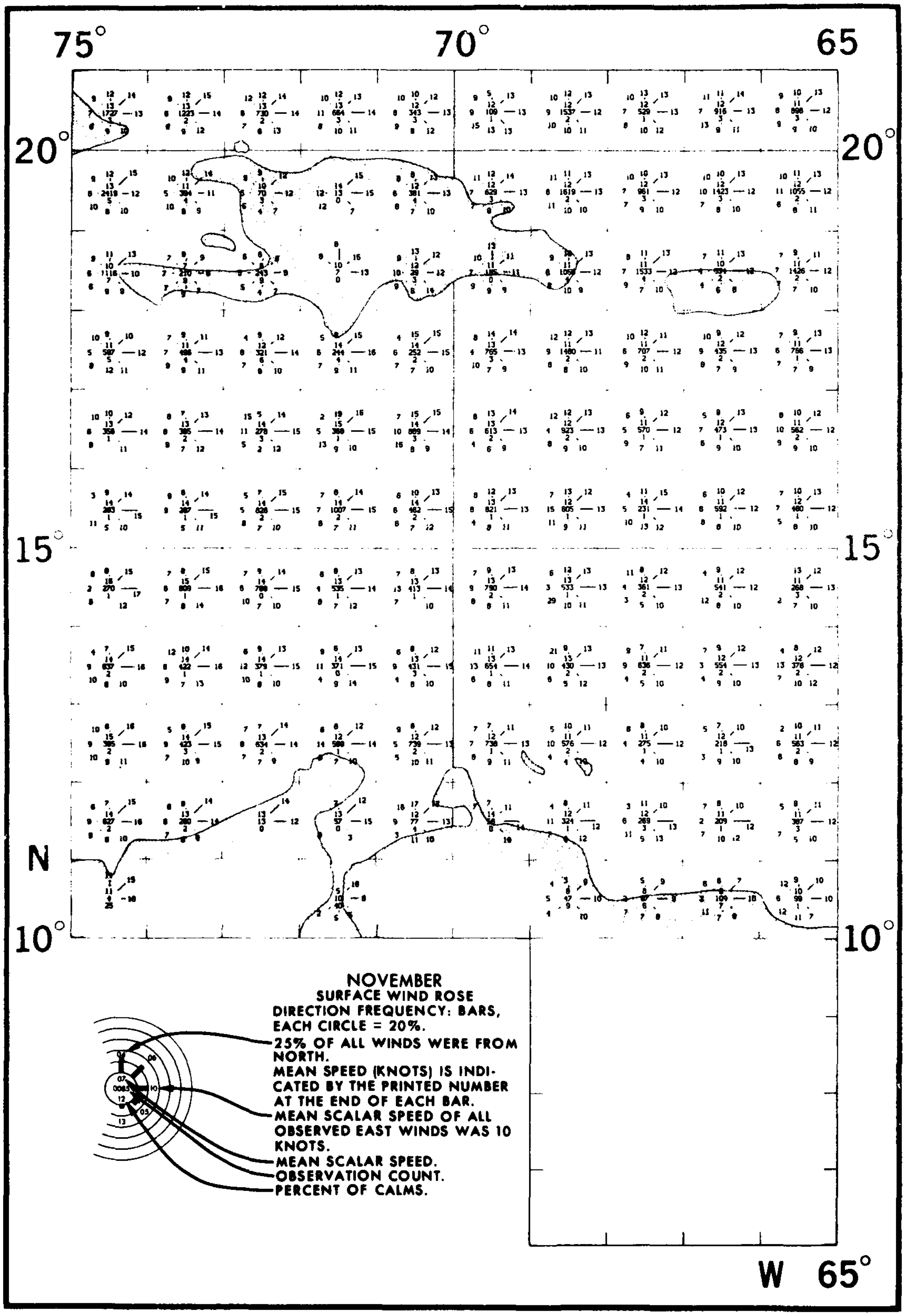
END
DATE
FILMED
10-86

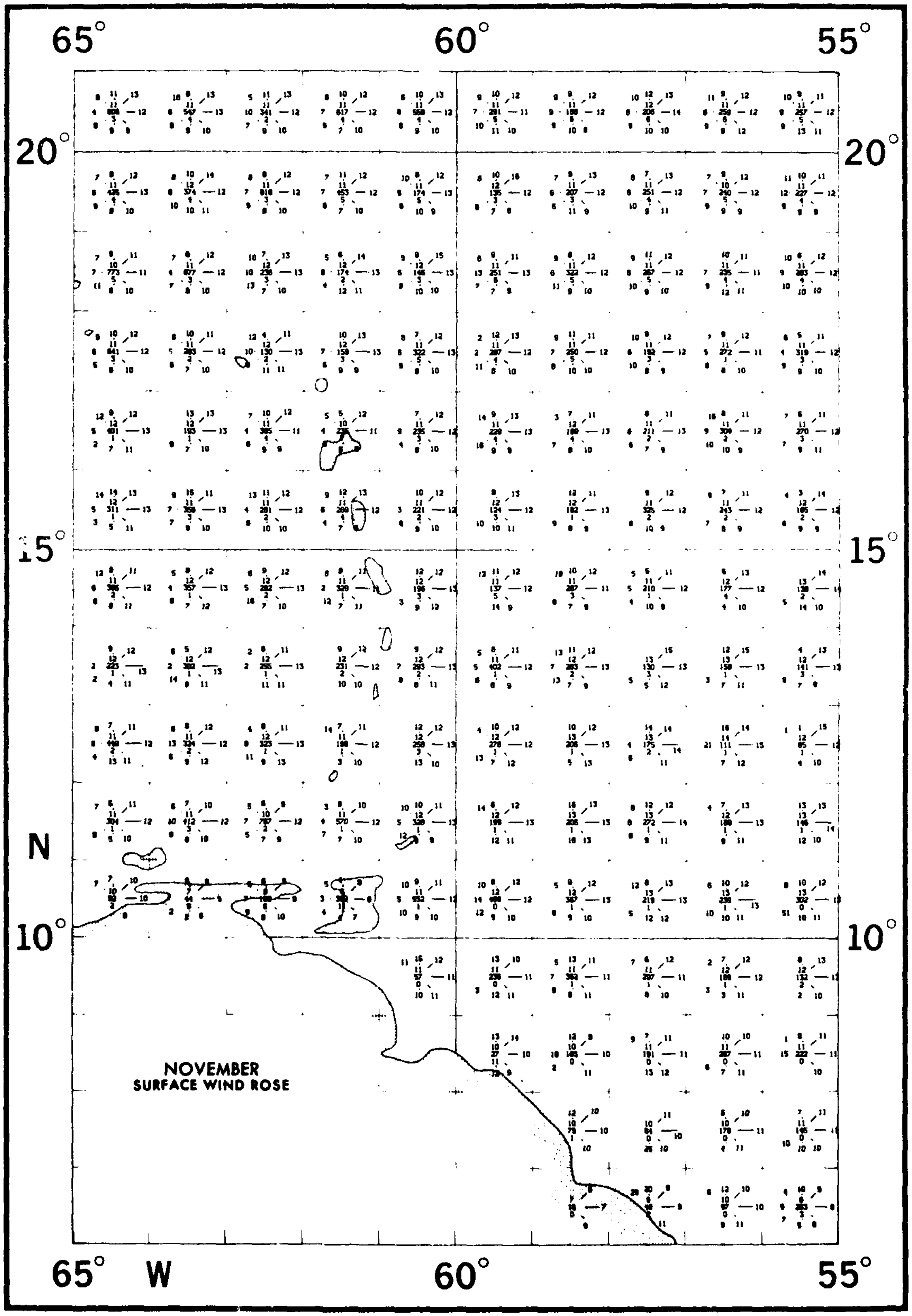

1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0

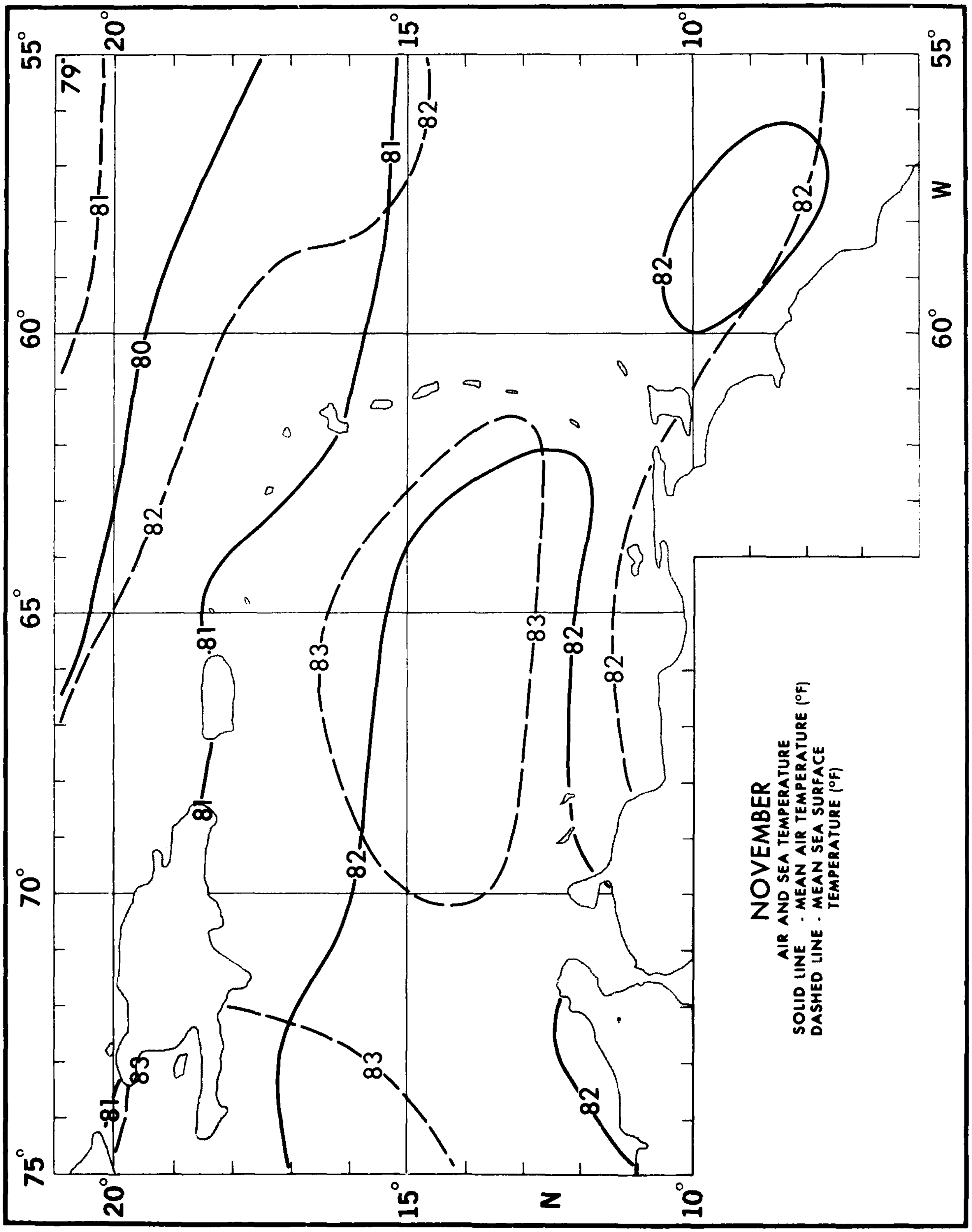

75°
70°
65°
60°
55°
20°
15°
10°
N
W
NOVEMBER
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE - WIND SPEED <11 KNOTS
DASHED LINE - WIND SPEED ≥34 KNOTS

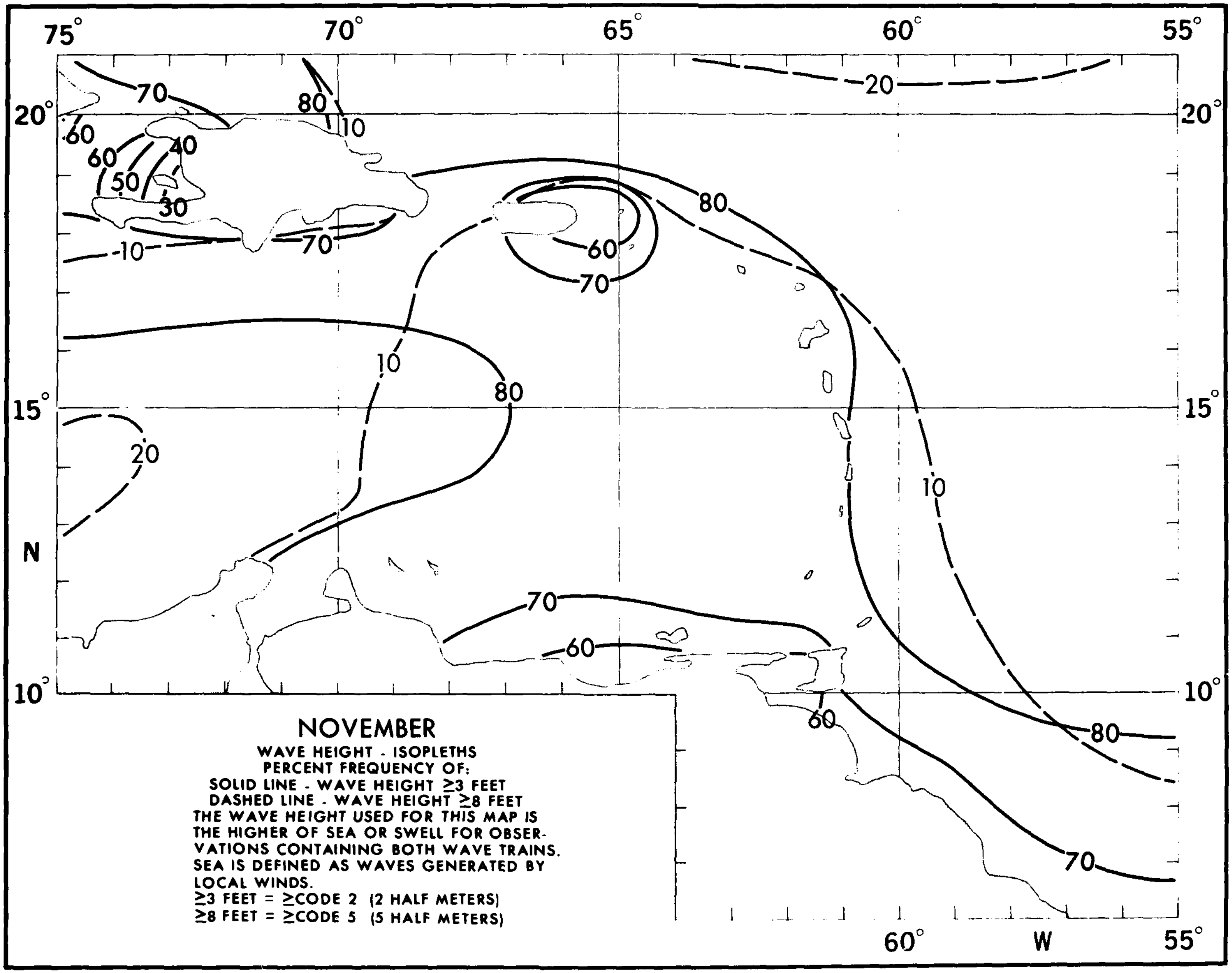


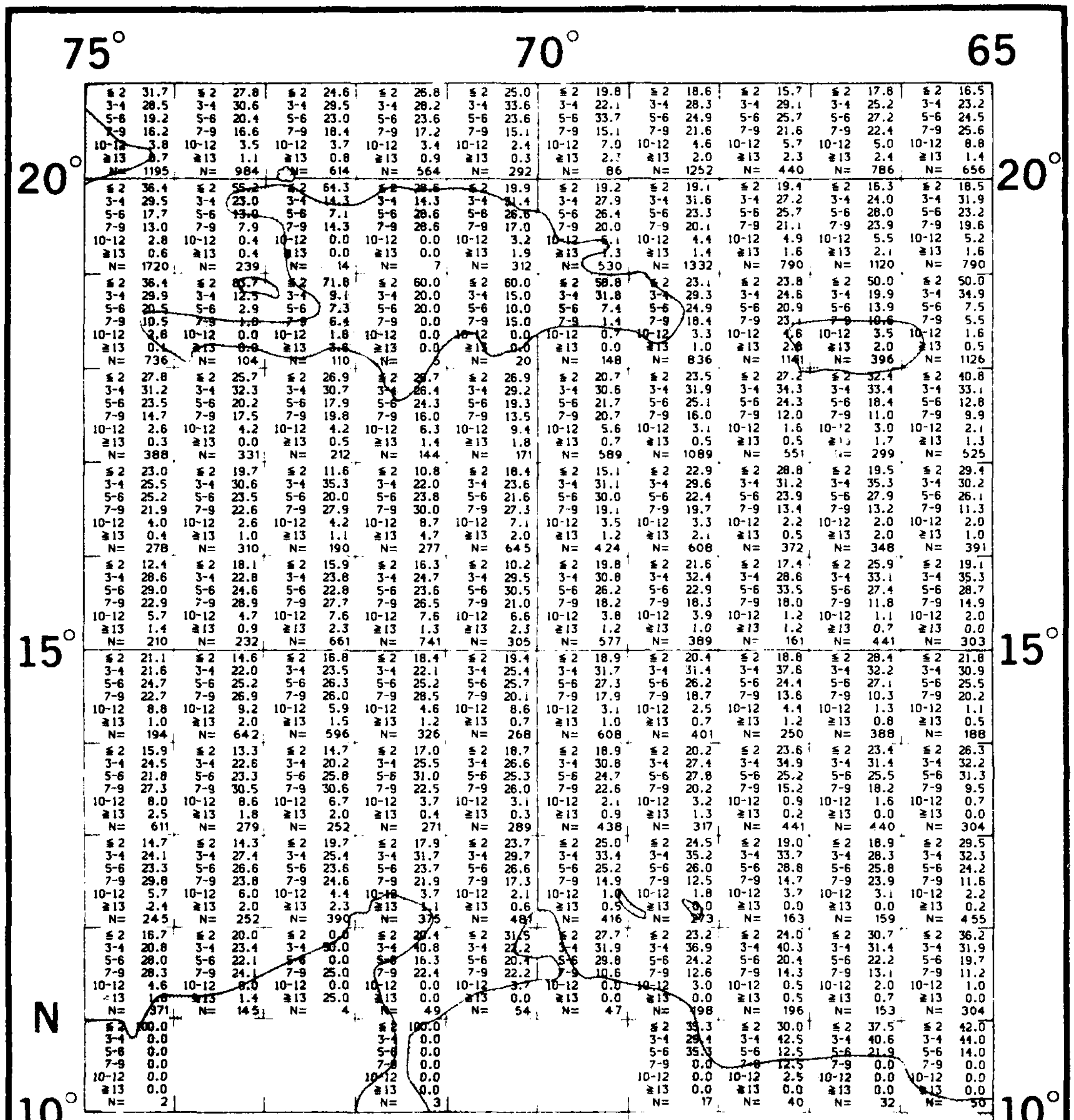
NOVEMBER
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE - WIND SPEED 11-21 KNOTS
DASHED LINE - WIND SPEED 22-33 KNOTS


75°
70°
65
20°
20°
15°
15°
N
10°
10°
W 65°
NOVEMBER
SURFACE WIND ROSE
DIRECTION FREQUENCY: BARS, EACH CIRCLE = 20%.
25% OF ALL WINDS WERE FROM NORTH.
MEAN SPEED (KNOTS) IS INDICATED BY THE PRINTED NUMBER AT THE END OF EACH BAR.
MEAN SCALAR SPEED OF ALL OBSERVED EAST WINDS WAS 10 KNOTS.
MEAN SCALAR SPEED.
OBSERVATION COUNT.
PERCENT OF CALMS.


65°
60°
55°
20°
15°
10°
N
W
NOVEMBER
SURFACE WIND ROSE


NOVEMBER
AIR AND SEA TEMPERATURE
SOLID LINE - MEAN AIR TEMPERATURE (°F)
DASHED LINE - MEAN SEA SURFACE TEMPERATURE (°F)
75°
70°
65°
60°
55°
20°
15°
10°
N
W

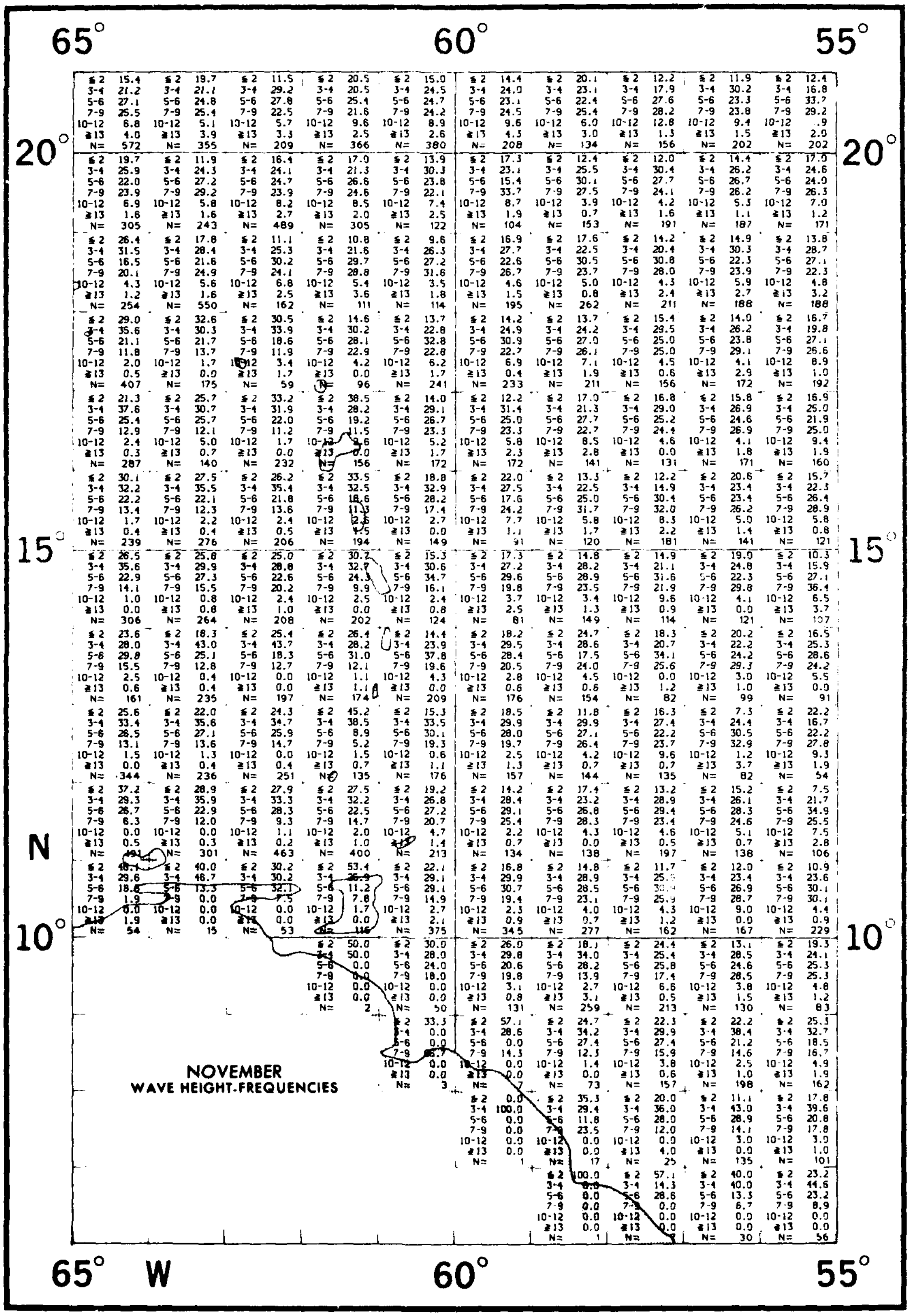

75° 70° 65° 60° 55°
20° 15° 10° N
60° W 55°
70
80
10
60
60
40
50
30
-10
70
20
80
60
70
10
80
20
70
60
10
60
80
70
NOVEMBER
WAVE HEIGHT - ISOPLETHS
PERCENT FREQUENCY OF:
SOLID LINE - WAVE HEIGHT ≥3 FEET
DASHED LINE - WAVE HEIGHT ≥8 FEET
THE WAVE HEIGHT USED FOR THIS MAP IS
THE HIGHER OF SEA OR SWELL FOR OBSERVATIONS CONTAINING BOTH WAVE TRAINS.
SEA IS DEFINED AS WAVES GENERATED BY
LOCAL WINDS.
≥3 FEET = ≥CODE 2 (2 HALF METERS)
≥8 FEET = ≥CODE 5 (5 HALF METERS)

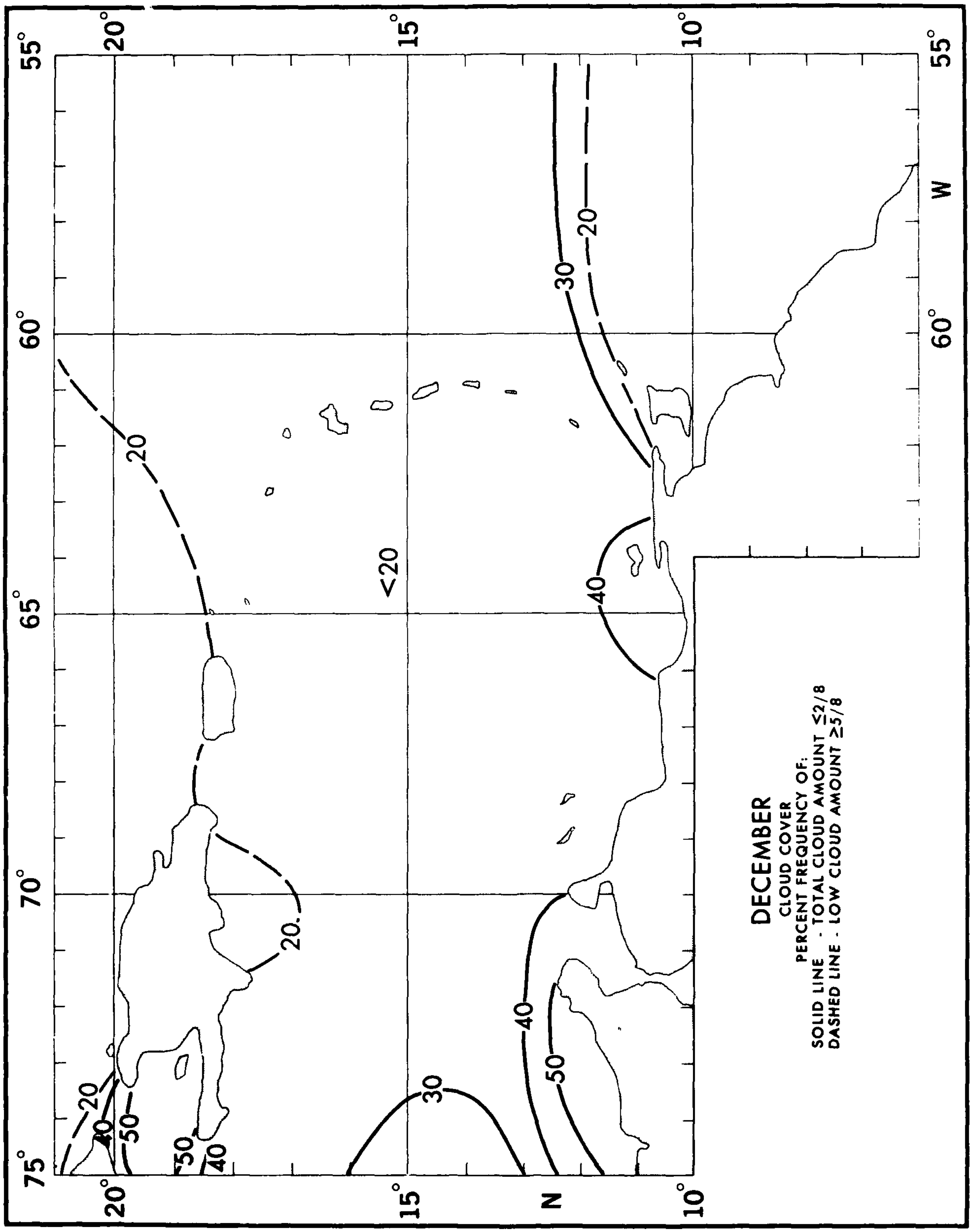


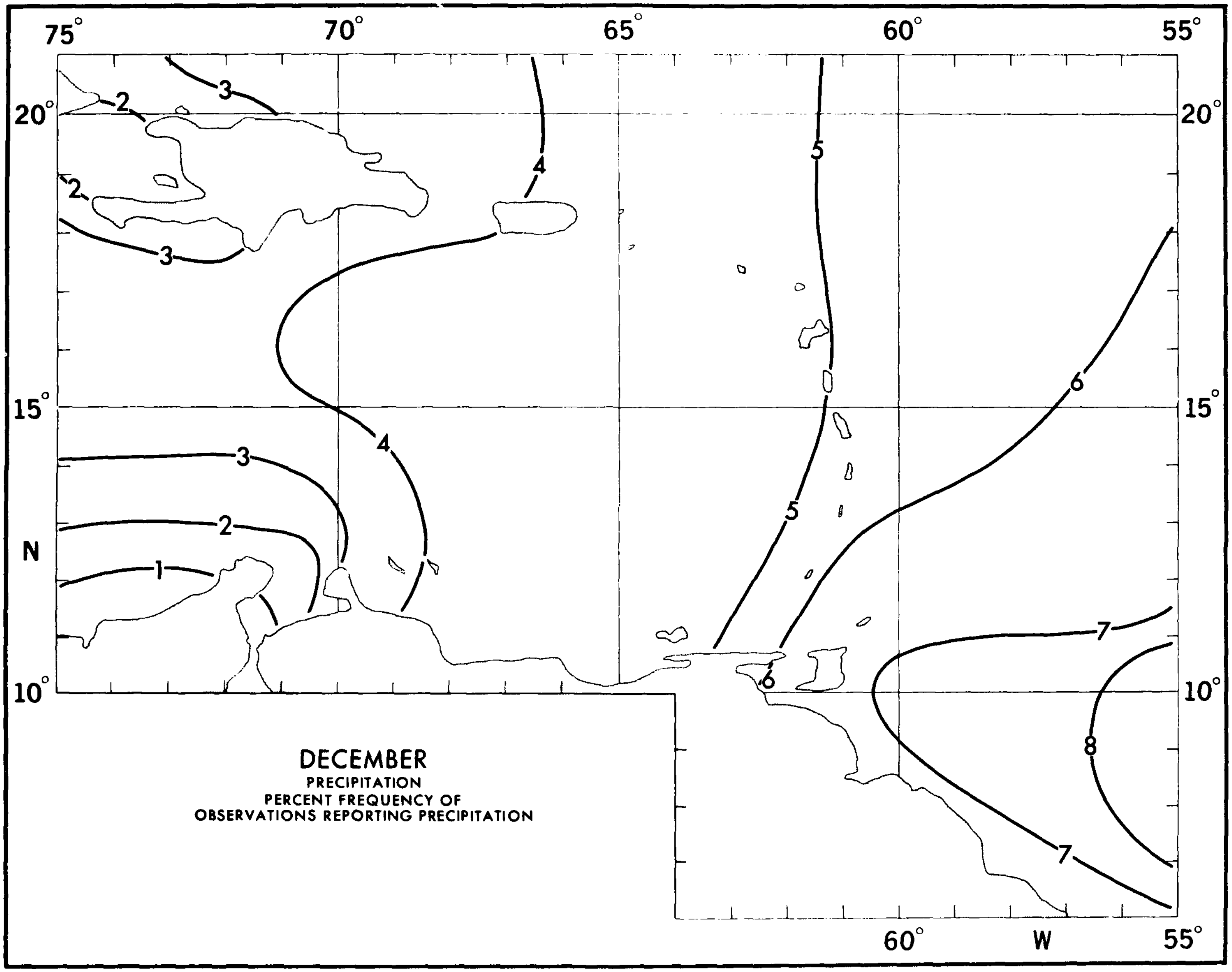
NOVEMBER
WAVE HEIGHT-FREQUENCIES

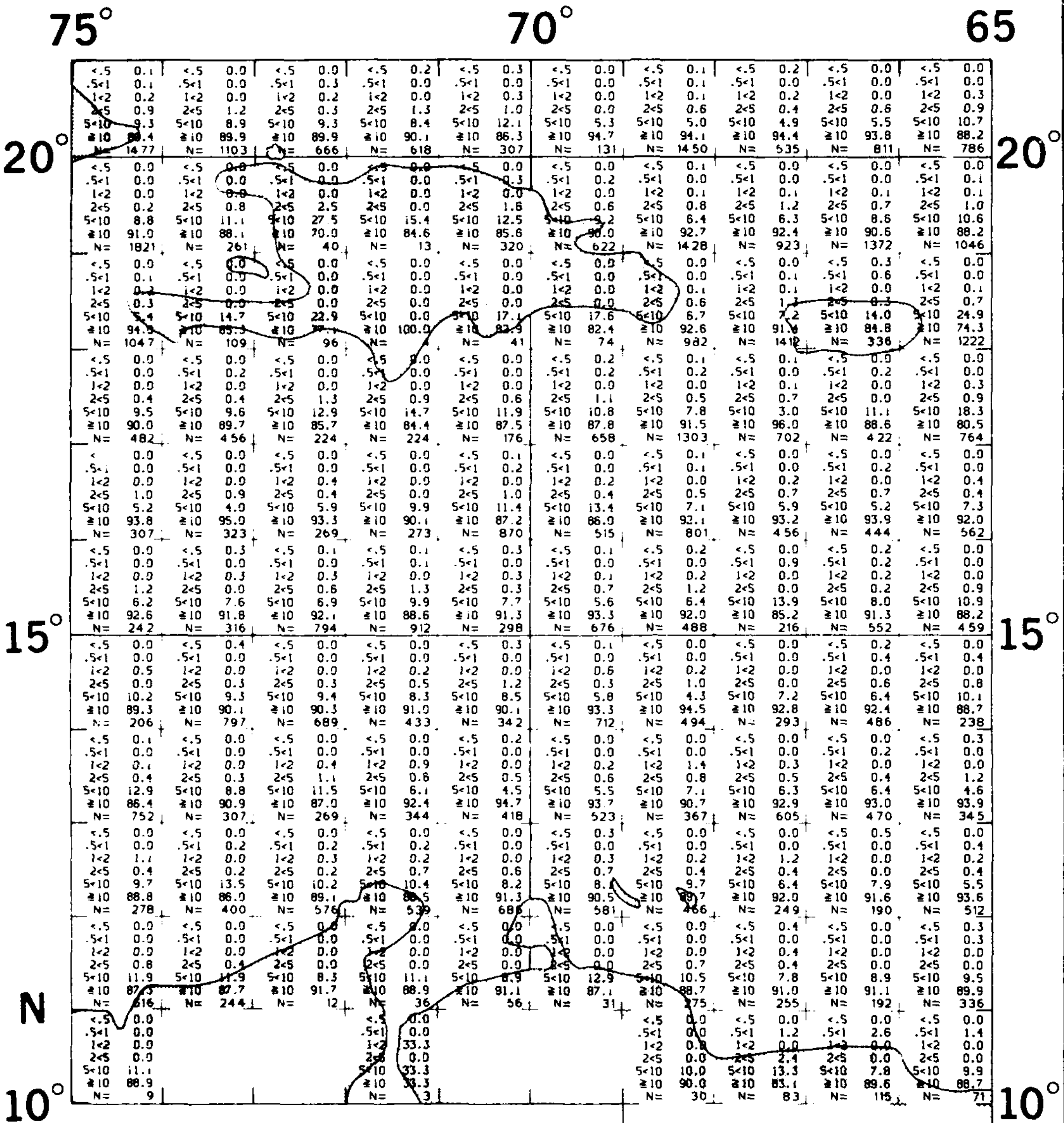
≤2	10.0	PERCENT FREQUENCY OF
3-4	20.0	VARIOUS RANGES WITHIN ONE-
5-6	30.0	DEGREE QUADRANGLES.
7-9	20.0	EXAMPLE:
10-12	10.0	30.0% OF ALL OBSERVED WAVE
≥13	10.0	HEIGHTS WERE IN THE RANGE 5
N =	1363	TO 6 FEET.

N = OBSERVATION COUNT.
WAVE DATA FOR THESE TABLES WERE SELECTED FROM THE HIGHER OF SEA OR SWELL WHEN BOTH WERE REPORTED.


65°
60°
55°
20°
15°
10°
N
W
NOVEMBER
WAVE HEIGHT-FREQUENCIES


DECEMBER
CLOUD COVER
PERCENT FREQUENCY OF:
SOLID LINE - TOTAL CLOUD AMOUNT ≤2/8
DASHED LINE - LOW CLOUD AMOUNT ≥5/8
<20
N
W
75°
70°
65°
60°
55°
20°
15°
10°

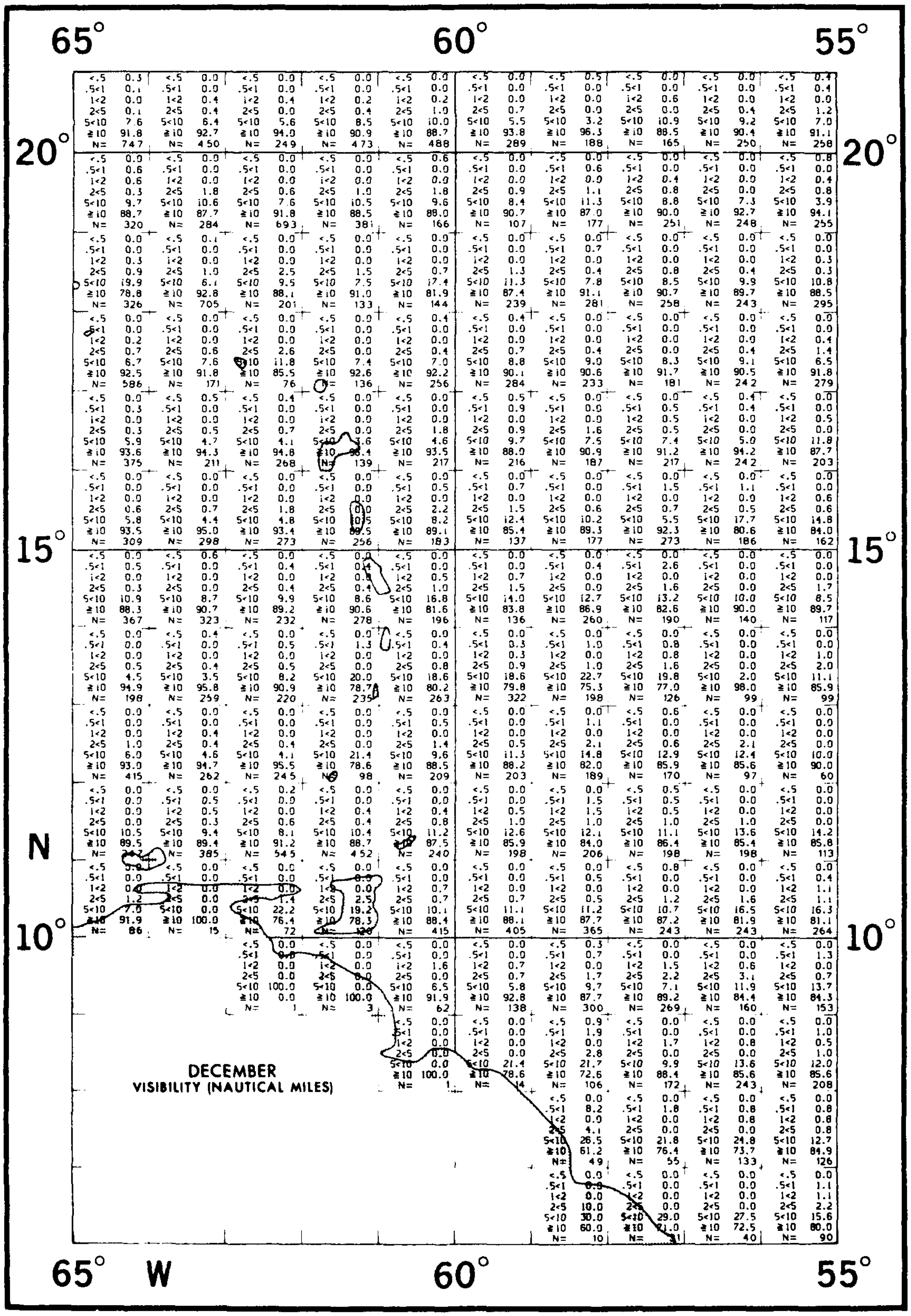

75°
70°
65°
60°
55°
20°
15°
10°
N
W
1
2
3
4
5
6
7
8
DECEMBER
PRECIPITATION
PERCENT FREQUENCY OF
OBSERVATIONS REPORTING PRECIPITATION

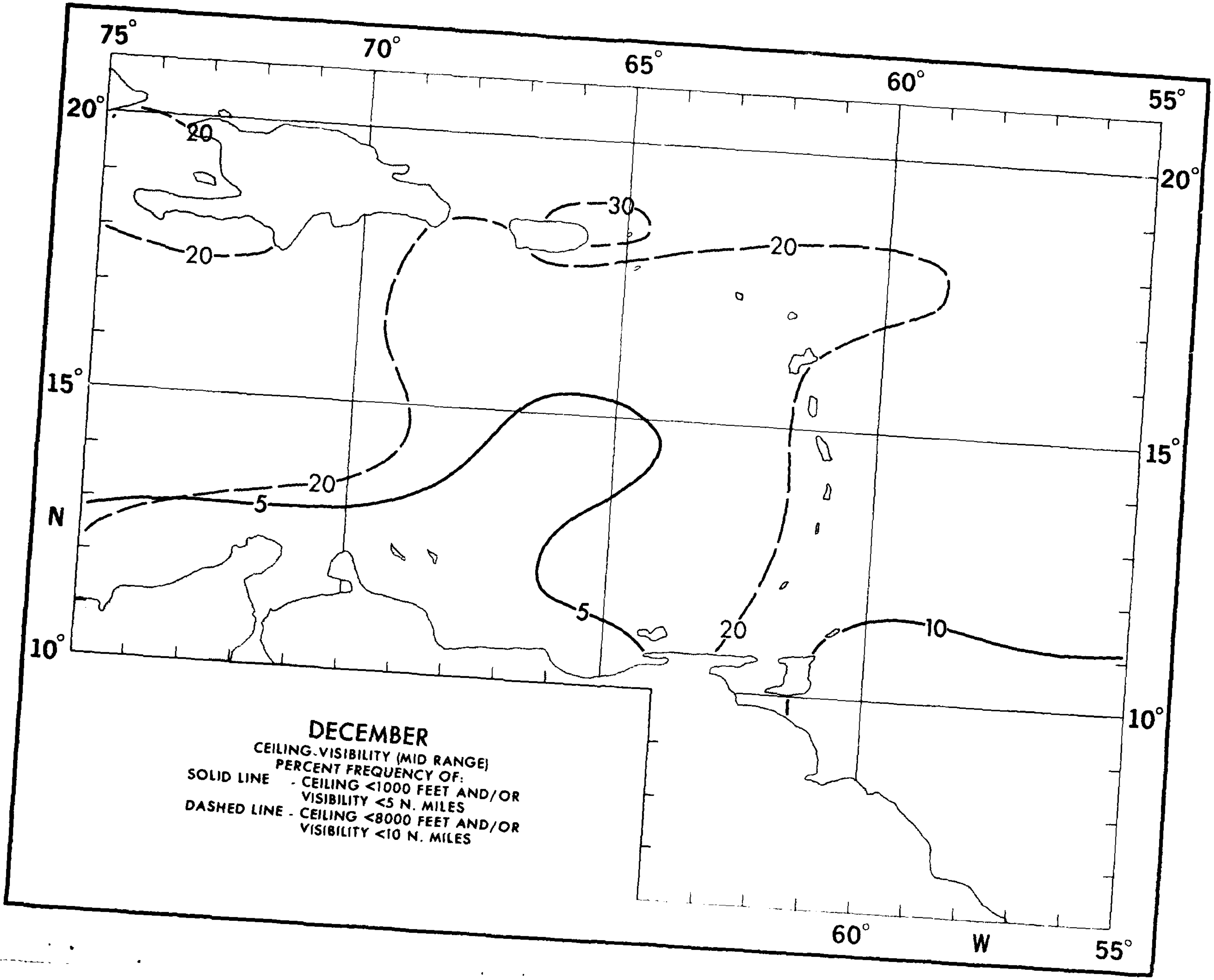


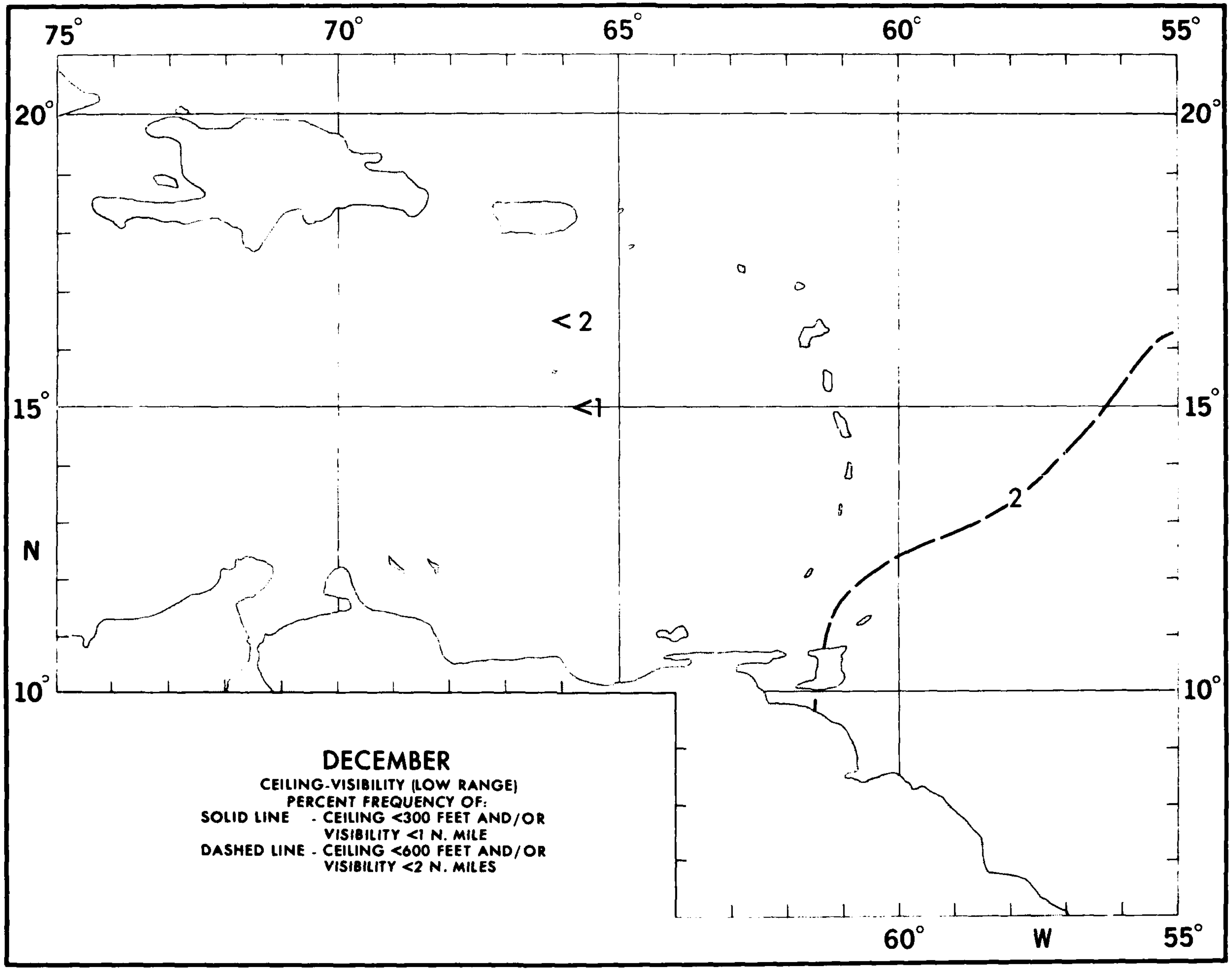
DECEMBER

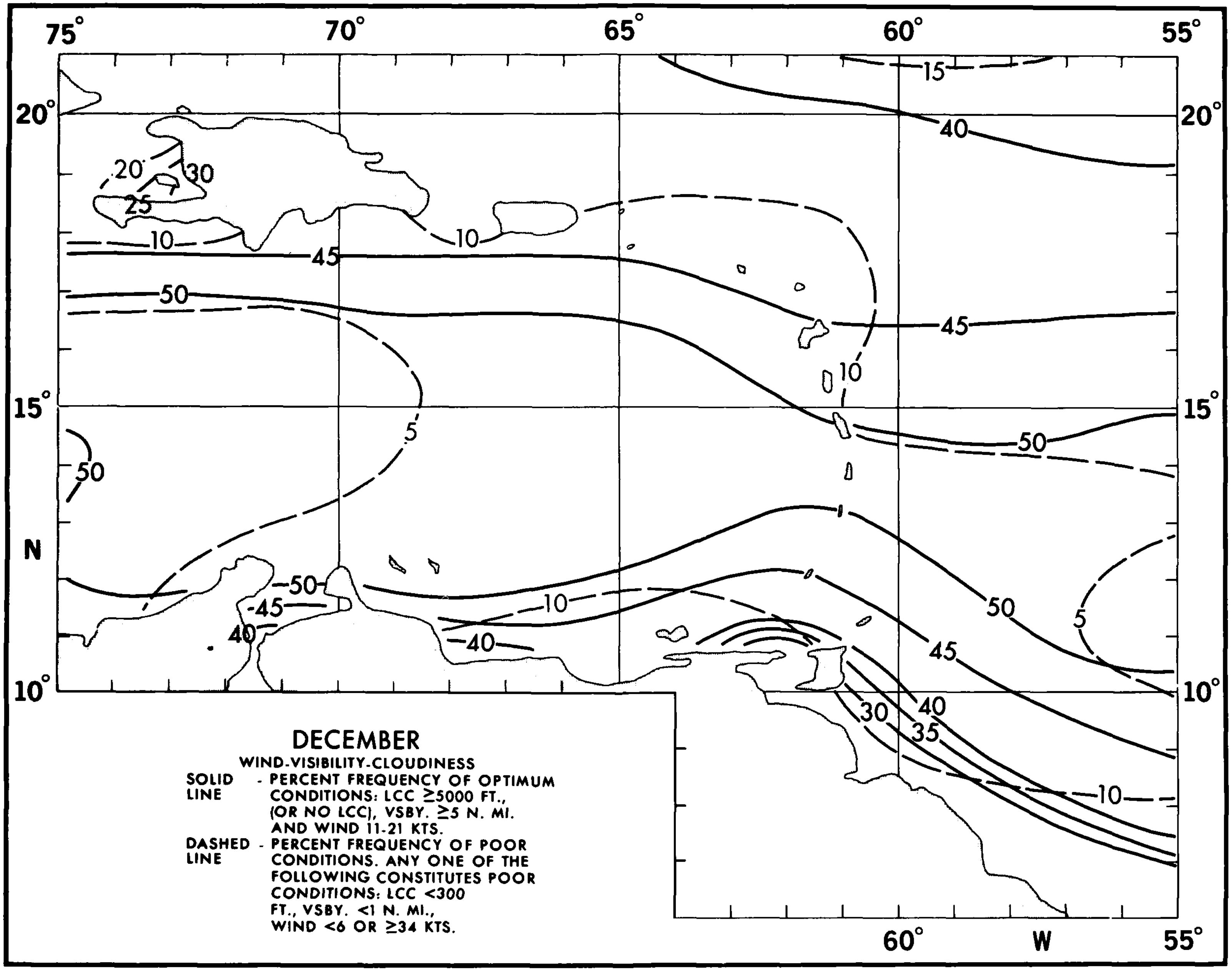
VISIBILITY (NAUTICAL MILES)

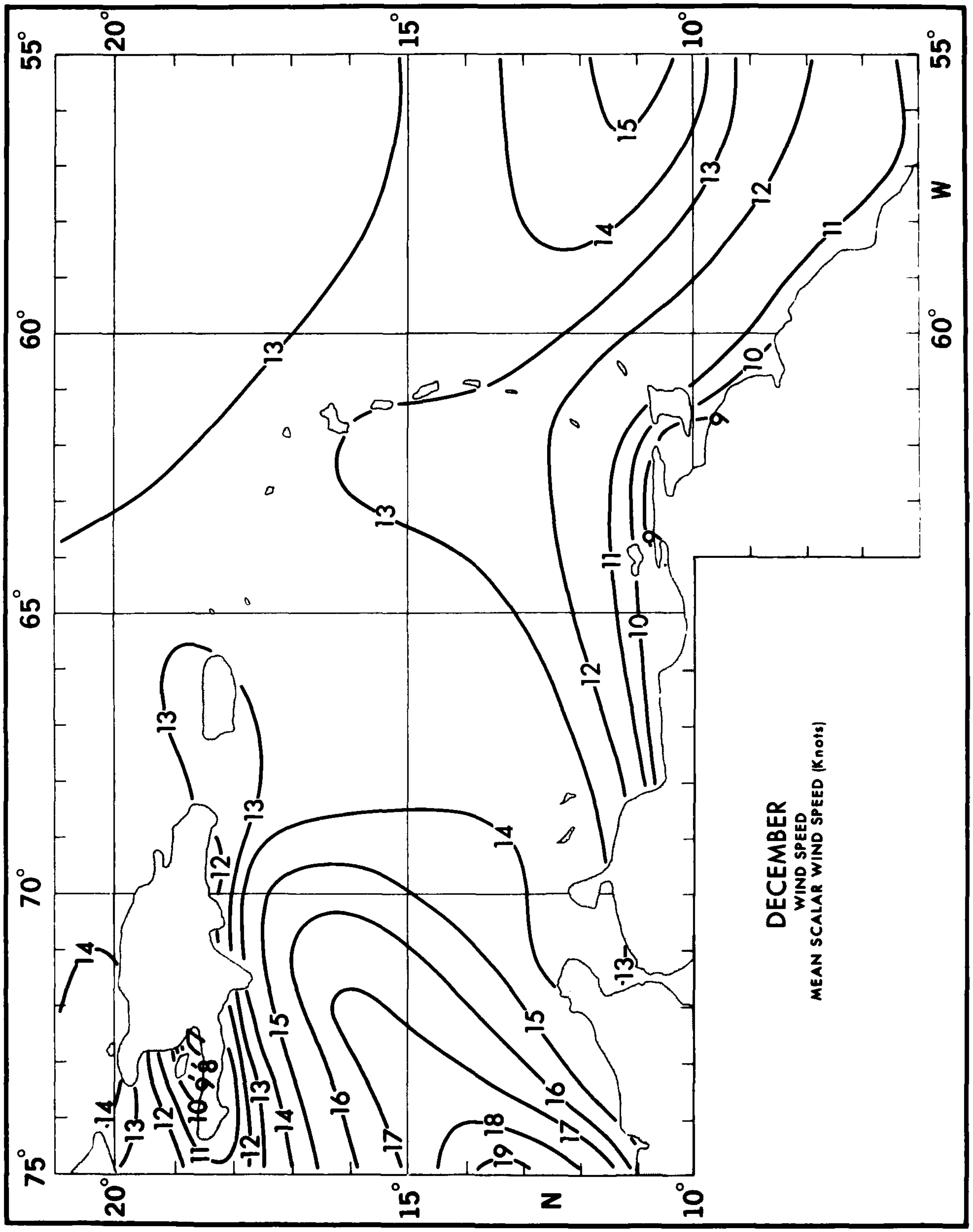
<.5	.2	PERCENT FREQUENCY OF VARIOUS RANGES WITHIN ONE-DEGREE QUADRANGLES.
.5 <1	3.1	EXAMPLE:
1 <2	6.7	3.1% OF THE OBSERVED VISIBILITIES WERE <1 BUT ≥1/2 N. MILE.
2 <5	10.0	OTHER PERCENTAGES CAN BE SIMILARLY INTERPRETED.
5 <10	60.0	N = OBSERVATION COUNT.
≥10	20.0	
N = 1234		

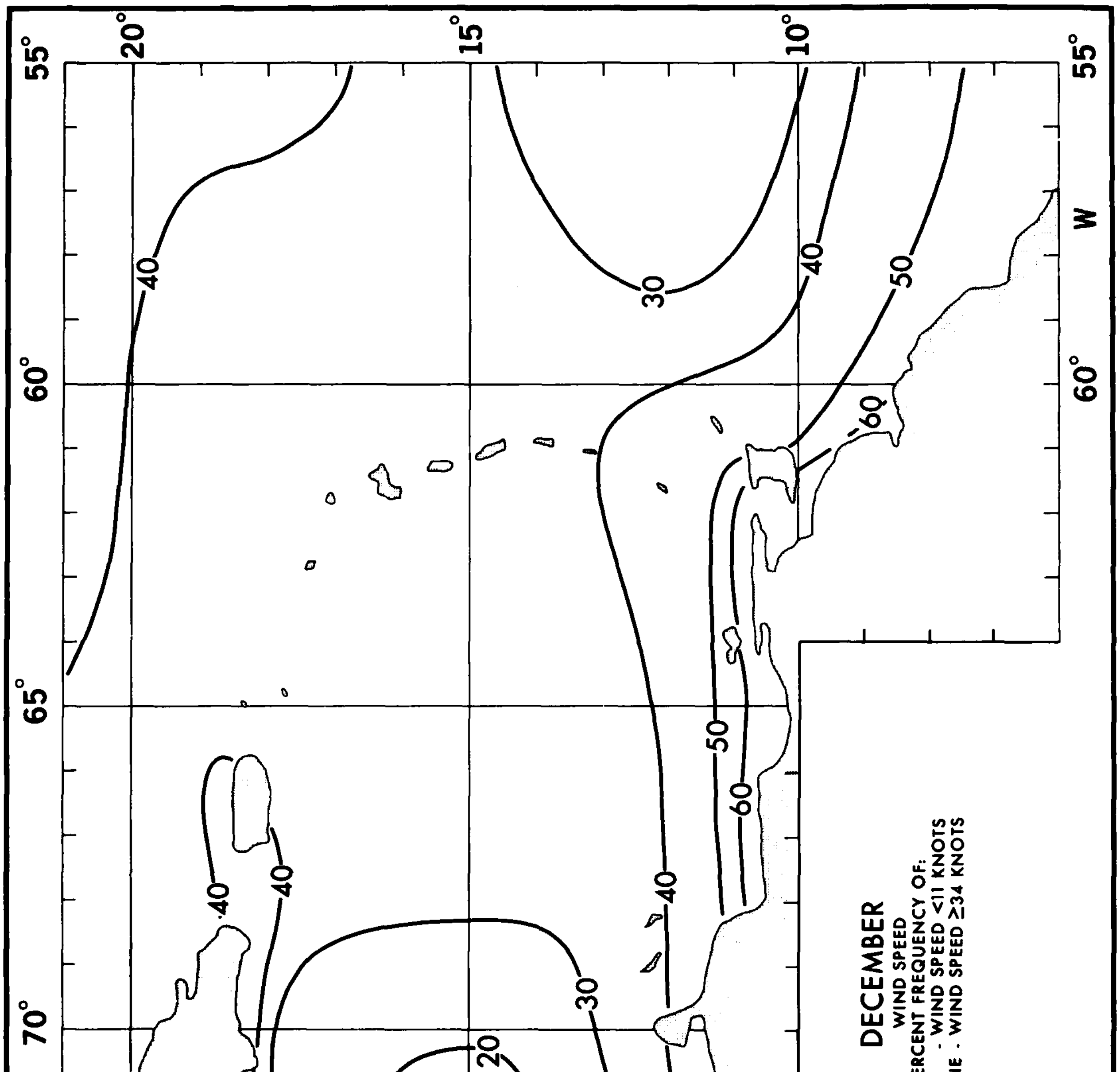

65°
60°
55°
20°
15°
N
10°
65° W
60°
55°
DECEMBER
VISIBILITY (NAUTICAL MILES)


DECEMBER
CEILING-VISIBILITY (MID RANGE)
PERCENT FREQUENCY OF:
SOLID LINE - CEILING <1000 FEET AND/OR VISIBILITY <5 N. MILES
DASHED LINE - CEILING <8000 FEET AND/OR VISIBILITY <10 N. MILES
75°
70°
65°
60°
55°
20°
15°
10°
N
W
30
20
10
5

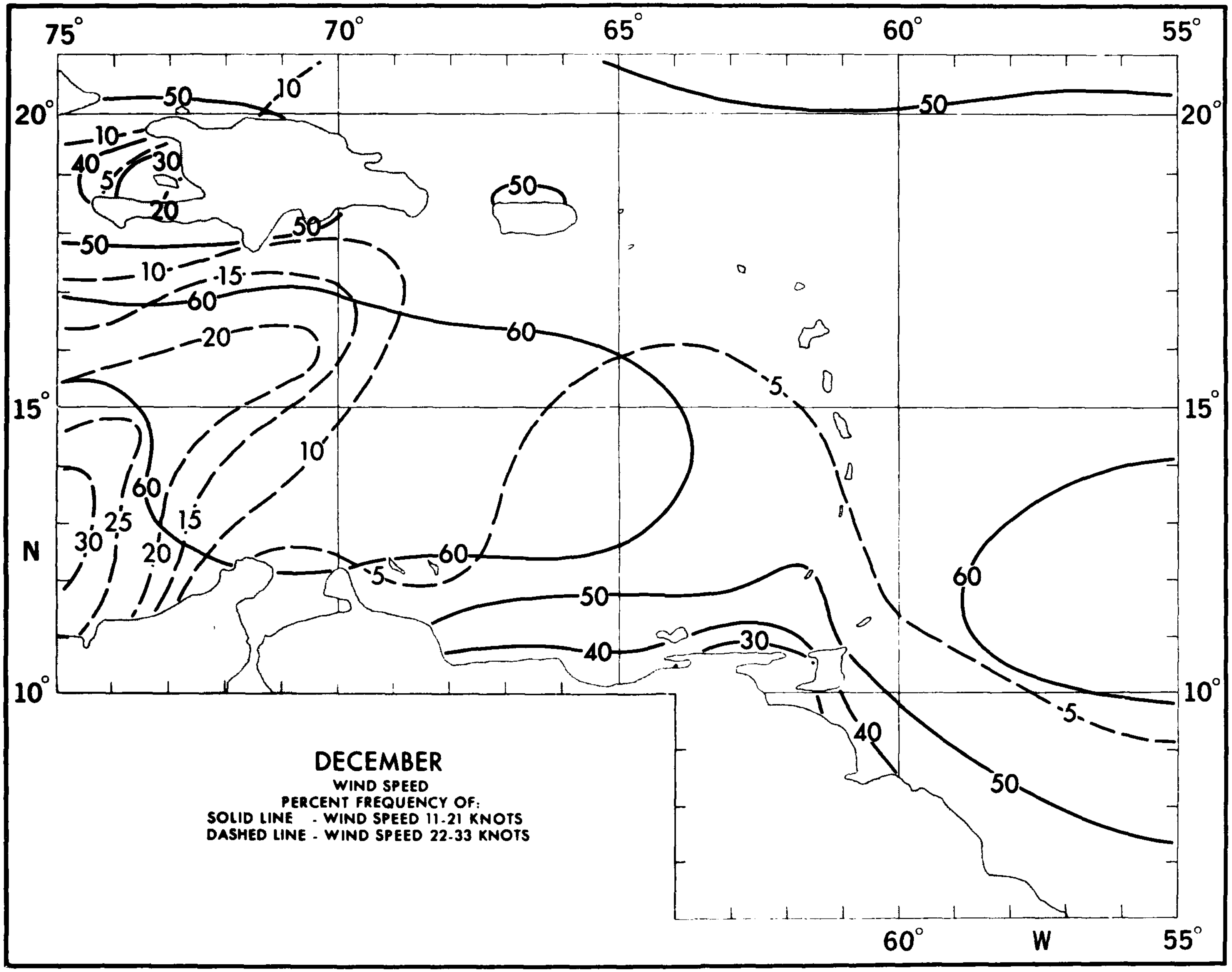

75°
70°
65°
60°
55°
20°
15°
10°
N
W
< 2
<1
2
DECEMBER
CEILING-VISIBILITY (LOW RANGE)
PERCENT FREQUENCY OF:
SOLID LINE - CEILING <300 FEET AND/OR VISIBILITY <1 N. MILE
DASHED LINE - CEILING <600 FEET AND/OR VISIBILITY <2 N. MILES


DECEMBER
WIND-VISIBILITY-CLOUDINESS
SOLID LINE - PERCENT FREQUENCY OF OPTIMUM CONDITIONS: LCC ≥5000 FT., (OR NO LCC), VSBY. ≥5 N. MI. AND WIND 11-21 KTS.
DASHED LINE - PERCENT FREQUENCY OF POOR CONDITIONS. ANY ONE OF THE FOLLOWING CONSTITUTES POOR CONDITIONS: LCC <300 FT., VSBY. <1 N. MI., WIND <6 OR ≥34 KTS.
75°
70°
65°
60°
55°
20°
15°
10°
N
W
10
15
20
25
30
35
40
45
50
5

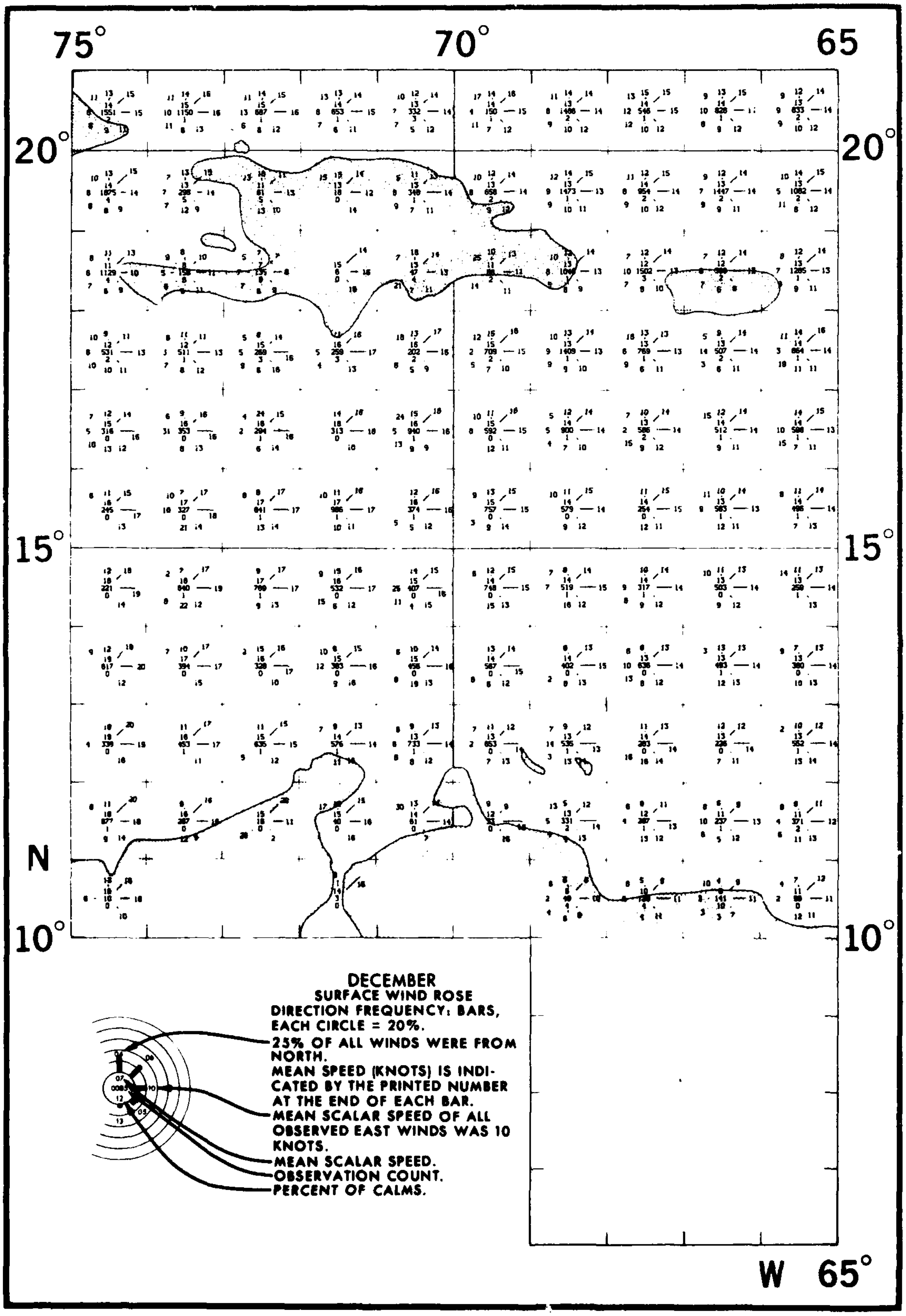

DECEMBER
WIND SPEED
MEAN SCALAR WIND SPEED (Knots)
75°
70°
65°
60°
55°
20°
15°
10°
N
W

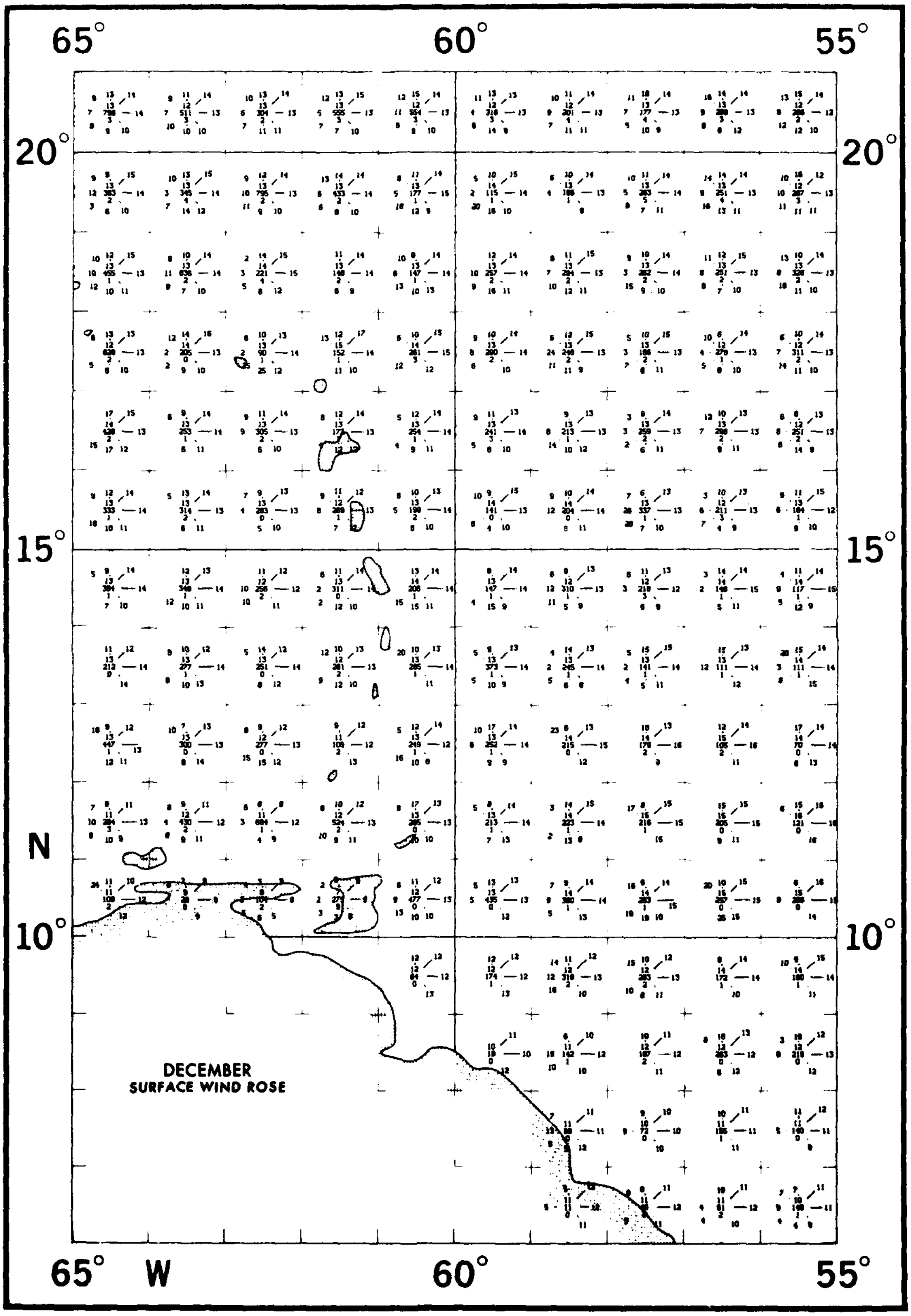


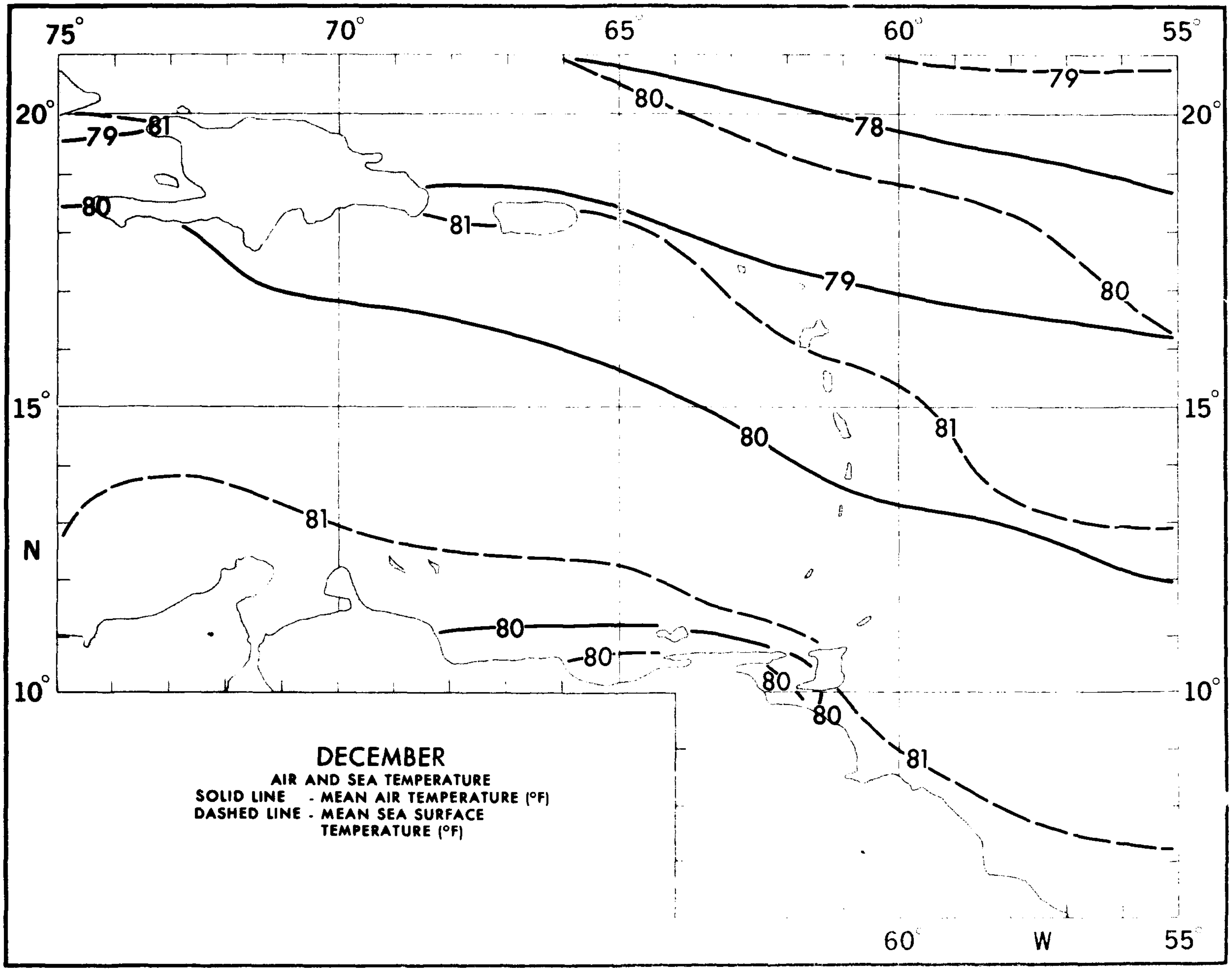
DECEMBER
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE - WIND SPEED <11 KNOTS
DASHED LINE - WIND SPEED ≥34 KNOTS



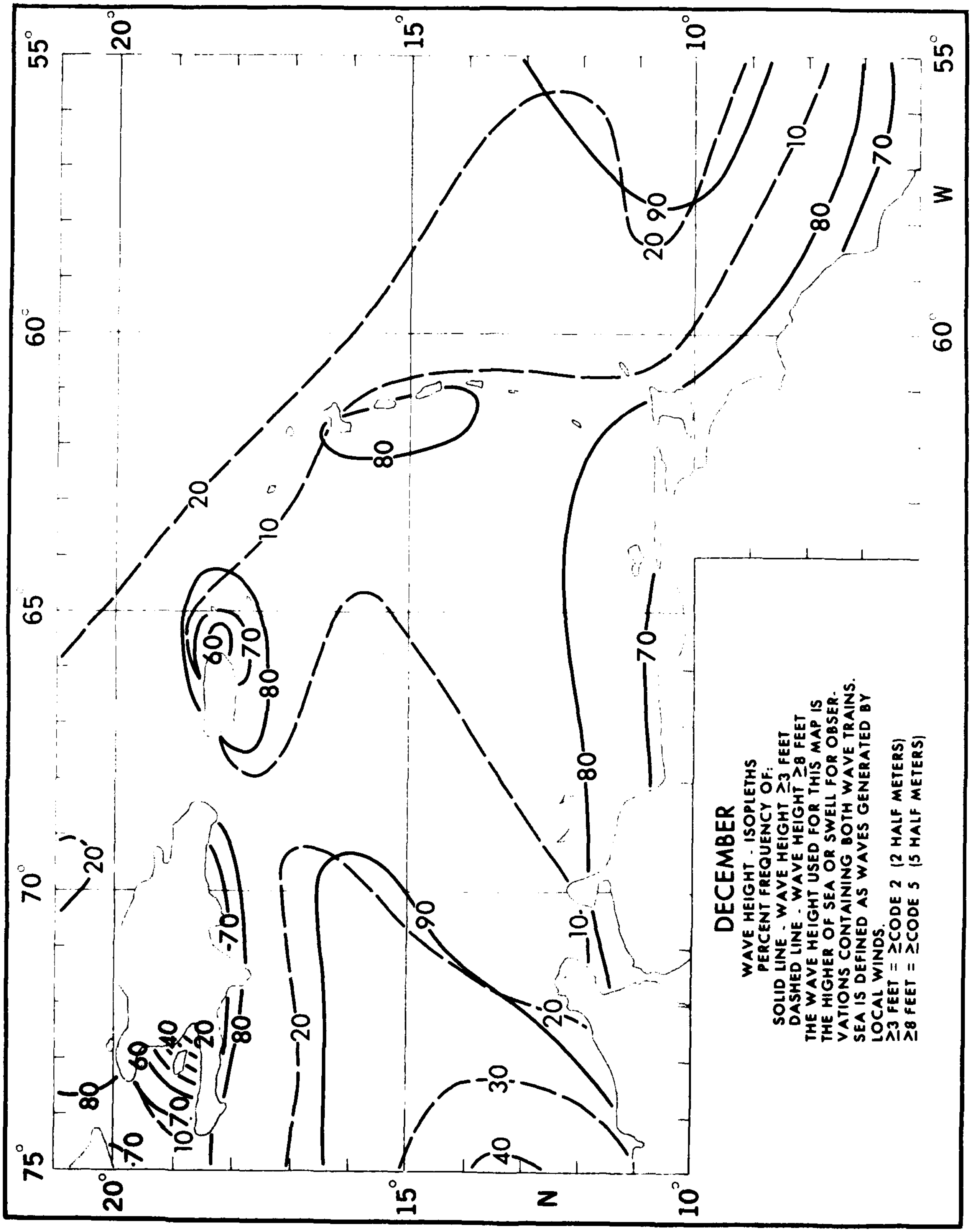
75°
70°
65°
60°
55°
20°
15°
10°
N
W
DECEMBER
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE - WIND SPEED 11-21 KNOTS
DASHED LINE - WIND SPEED 22-33 KNOTS


75°
70°
65
20°
15°
10°
N
W 65°
DECEMBER
SURFACE WIND ROSE
DIRECTION FREQUENCY: BARS, EACH CIRCLE = 20%.
25% OF ALL WINDS WERE FROM NORTH.
MEAN SPEED (KNOTS) IS INDICATED BY THE PRINTED NUMBER AT THE END OF EACH BAR.
MEAN SCALAR SPEED OF ALL OBSERVED EAST WINDS WAS 10 KNOTS.
MEAN SCALAR SPEED.
OBSERVATION COUNT.
PERCENT OF CALMS.


65°
60°
55°
20°
15°
N
10°
DECEMBER
SURFACE WIND ROSE
65° W
60°
55°



DECEMBER
AIR AND SEA TEMPERATURE
SOLID LINE - MEAN AIR TEMPERATURE (°F)
DASHED LINE - MEAN SEA SURFACE TEMPERATURE (°F)


DECEMBER
WAVE HEIGHT - ISOPLETHS
PERCENT FREQUENCY OF:
SOLID LINE - WAVE HEIGHT ≥3 FEET
DASHED LINE - WAVE HEIGHT ≥8 FEET
THE WAVE HEIGHT USED FOR THIS MAP IS
THE HIGHER OF SEA OR SWELL FOR OBSER-
VATIONS CONTAINING BOTH WAVE TRAINS.
SEA IS DEFINED AS WAVES GENERATED BY
LOCAL WINDS.
≥3 FEET = ≥CODE 2 (2 HALF METERS)
≥8 FEET = ≥CODE 5 (5 HALF METERS)
75°
70°
65°
60°
55°
20°
15°
10°
N
W

75° 70° 65

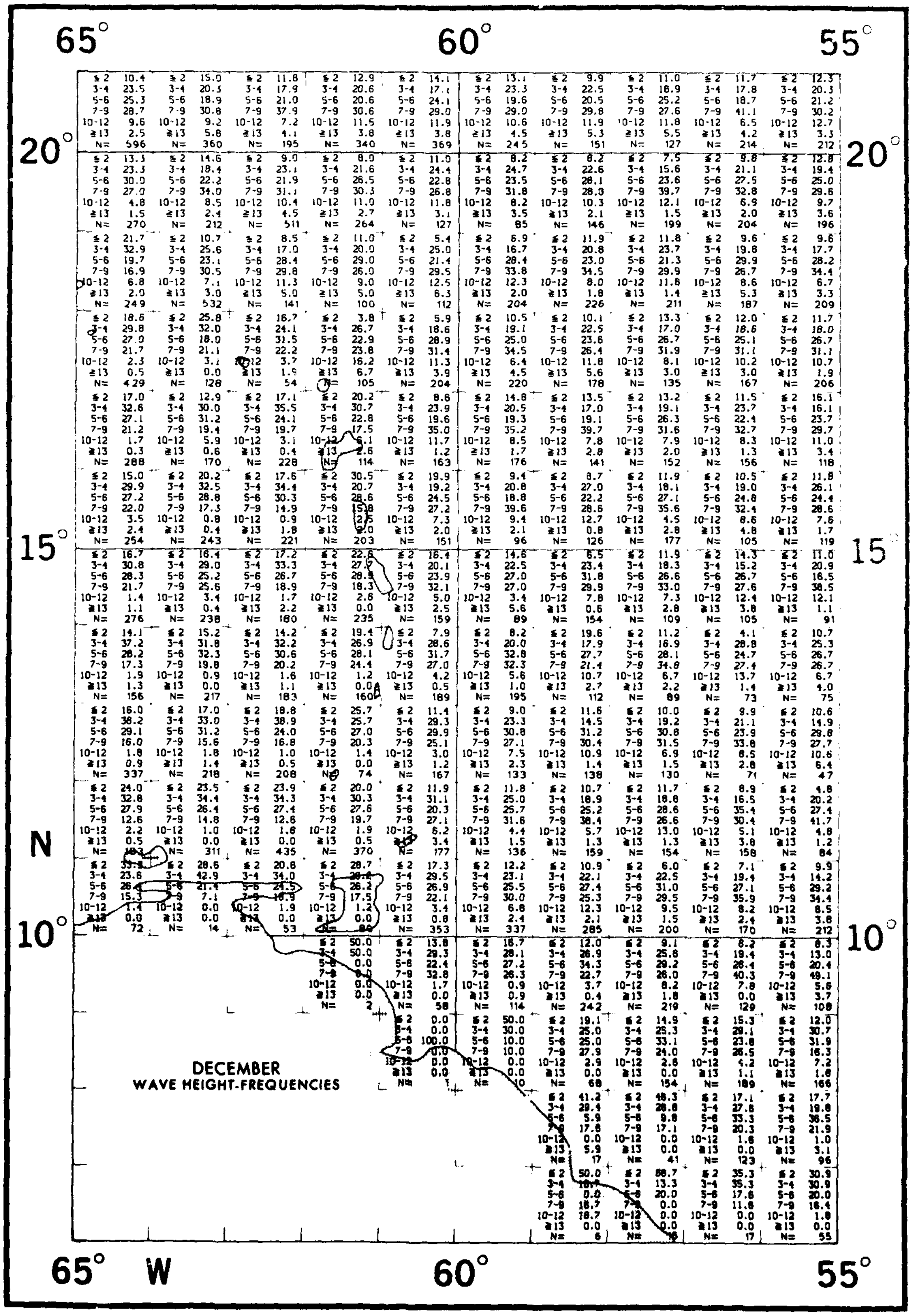
≤2	23.5	18.5	19.0	18.6	18.6	16.5	14.5	17.1	11.5	8.8
3-4	26.2	28.9	29.3	27.3	30.5	20.7	25.2	28.1	25.6	23.3
5-6	23.6	25.3	26.1	25.5	26.8	21.5	26.2	21.8	26.9	25.0
7-9	19.8	21.1	21.3	25.0	19.0	25.6	25.9	25.1	27.4	29.8
10-12	5.2	4.7	3.2	2.4	3.7	11.6	6.4	6.4	6.5	9.8
≥13	1.7	1.5	1.2	1.3	1.5	4.1	1.8	1.5	2.0	3.3
N=	1087	934	591	553	269	121	1191	455	737	571
≤2	26.0	34.8	36.0	0.0	18.8	17.4	13.9	12.3	12.3	14.8
3-4	29.5	28.3	44.0	25.0	32.6	28.2	28.6	23.8	23.2	27.0
5-6	20.5	16.6	4.0	37.5	26.0	23.9	27.0	26.2	25.4	20.7
7-9	18.8	15.5	16.0	37.5	27.4	25.0	23.5	27.8	27.6	27.8
10-12	4.2	4.3	0.0	0.0	3.8	3.8	5.6	7.8	8.3	7.8
≥13	1.2	0.5	0.0	0.0	1.4	1.8	1.4	2.2	3.2	1.9
N=	1368	187	25	8	288	553	1204	787	1140	856
≤2	29.1	61.3	88.2	25.0	27.6	41.3	16.4	17.5	21.2	47.0
3-4	30.9	17.7	6.9	25.0	24.1	31.7	25.2	26.1	26.1	32.7
5-6	20.6	12.9	1.7	25.0	20.7	12.7	26.3	23.3	25.4	11.2
7-9	15.7	8.1	3.4	25.0	20.7	11.1	25.5	25.2	18.0	7.3
10-12	2.9	0.0	1.7	0.0	3.4	1.6	4.9	8.7	5.3	1.4
≥13	0.8	0.0	0.0	0.0	3.4	1.6	1.6	1.2	3.0	0.5
N=	732	62	58	4	29	63	816	1112	264	1028
≤2	16.8	17.4	17.7	19.3	13.9	9.5	16.4	21.9	25.7	33.5
3-4	30.1	29.0	24.1	22.9	22.6	24.5	29.2	32.7	32.7	33.8
5-6	23.8	29.0	25.9	22.9	29.2	24.3	28.0	26.0	21.1	16.3
7-9	26.3	20.8	22.8	31.2	28.5	27.0	20.9	16.4	18.0	14.2
10-12	2.7	3.2	7.0	5.1	2.9	10.8	4.3	2.6	2.1	1.7
≥13	0.3	0.6	2.5	2.5	2.9	3.9	1.2	0.5	0.3	0.5
N=	369	317	158	157	137	518	1019	581	327	606
≤2	13.7	10.5	11.9	5.9	6.5	9.9	13.4	16.9	13.8	13.6
3-4	23.9	19.8	22.7	11.8	18.4	20.1	29.4	30.7	31.2	29.6
5-6	27.4	27.5	28.1	24.9	27.2	32.5	29.2	26.0	28.5	30.0
7-9	23.9	33.3	27.6	38.5	35.1	28.2	22.5	20.7	22.8	22.1
10-12	8.5	7.0	5.4	13.1	8.6	8.1	4.2	5.2	3.3	3.8
≥13	2.6	1.9	4.3	5.9	4.2	1.3	1.1	0.6	0.5	0.9
N=	234	258	185	221	673	394	612	362	369	426
≤2	10.8	7.5	7.1	6.8	8.9	10.1	13.6	14.3	14.4	13.1
3-4	16.0	17.7	17.1	15.7	20.2	25.8	27.1	31.7	30.0	27.2
5-6	25.3	23.4	23.2	28.1	29.0	27.7	26.0	23.6	30.4	29.9
7-9	34.5	35.5	35.3	33.2	34.3	30.1	28.8	25.5	21.7	24.8
10-12	8.8	11.3	11.1	11.4	6.0	4.4	4.2	3.1	2.6	4.5
≥13	4.6	4.5	6.3	4.8	1.6	1.8	0.3	1.9	0.9	0.6
N=	194	265	651	702	248	542	354	161	424	335
≤2	5.8	6.2	8.6	6.1	10.4	10.5	11.2	8.5	14.5	16.9
3-4	22.6	14.5	18.2	16.0	15.9	27.2	26.2	34.1	33.2	30.5
5-6	20.0	18.5	25.1	27.9	30.7	29.9	30.0	29.6	31.2	26.6
7-9	29.0	38.3	35.8	36.2	32.7	27.4	25.4	22.9	19.2	22.0
10-12	14.8	15.4	9.0	11.7	7.2	4.2	5.9	4.5	1.9	3.4
≥13	7.7	7.2	3.3	2.1	3.2	0.7	1.3	0.4	0.0	0.6
N=	155	650	545	326	251	569	393	223	365	177
≤2	4.0	5.0	8.3	8.9	13.7	12.0	14.6	13.2	16.3	15.2
3-4	10.3	17.2	13.0	24.2	22.5	27.7	27.1	28.1	30.8	35.7
5-6	18.3	19.5	28.3	25.9	25.2	32.4	28.2	28.6	25.8	26.5
7-9	44.0	41.4	33.9	31.7	31.6	23.8	25.7	26.4	23.4	19.1
10-12	14.8	12.6	10.0	6.5	5.8	3.7	3.2	2.9	2.9	3.5
≥13	8.6	4.2	6.5	2.7	1.2	0.5	1.1	0.9	0.8	0.0
N=	595	261	230	293	329	408	280	455	380	283
≤2	5.0	9.0	9.4	14.0	13.8	17.0	18.3	12.7	11.3	16.8
3-4	13.6	18.9	18.7	21.2	28.8	29.6	30.3	27.7	32.5	31.3
5-6	22.6	26.9	29.6	27.6	30.7	28.3	29.2	31.8	32.5	31.5
7-9	39.4	33.2	29.9	32.0	21.2	22.1	18.3	24.9	21.2	18.4
10-12	14.0	8.6	11.2	4.1	3.4	1.3	2.5	1.7	2.6	1.8
≥13	5.4	3.3	1.3	1.0	2.1	1.6	1.4	1.2	0.0	0.2
N=	221	301	385	387	472	371	284	173	151	435
≤2	3.5	10.1	16.7	12.0	22.9	20.8	14.8	26.6	26.6	23.7
3-4	14.2	23.7	33.3	32.0	22.9	50.0	32.5	31.5	32.9	32.6
5-6	24.4	22.3	16.7	36.0	20.8	20.8	33.5	26.6	28.5	30.1
7-9	37.9	33.1	33.3	20.0	27.1	4.2	17.7	13.0	8.2	11.5
10-12	14.2	6.5	0.0	0.0	4.2	4.2	1.0	2.2	3.2	1.8
≥13	5.7	4.3	0.0	0.0	2.1	0.0	0.5	0.0	0.6	0.4
N=	401	139	6	25	48	24	203	184	158	279
≤2	16.7			100.0			55.0	29.8	14.6	36.0
3-4	16.7			0.0			30.0	38.6	29.2	38.0
5-6	33.3			0.0			5.0	19.3	42.7	18.0
7-9	16.7			0.0			5.0	12.3	13.5	8.0
10-12	16.7			0.0			5.0	0.0	0.0	0.0
≥13	0.0			0.0			0.0	0.0	0.0	0.0
N=	6			1			20	57	96	50

20° 15° N 10° W 65°

DECEMBER
WAVE HEIGHT-FREQUENCIES

≤2	10.0	PERCENT FREQUENCY OF
3-4	20.0	VARIOUS RANGES WITHIN ONE-
5-6	30.0	DEGREE QUADRANGLES.
7-9	20.0	EXAMPLE:
10-12	10.0	30.0% OF ALL OBSERVED WAVE
≥13	10.0	HEIGHTS WERE IN THE RANGE 5
N =	1363	TO 6 FEET.

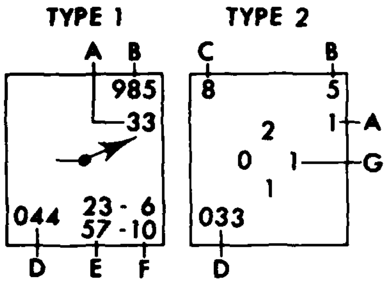
N = OBSERVATION COUNT.
WAVE DATA FOR THESE TABLES WERE SELECTED FROM THE HIGHER OF SEA OR SWELL WHEN BOTH WERE REPORTED.


65°
60°
55°
20°
15°
N
10°
65° W
60°
55°
DECEMBER
WAVE HEIGHT-FREQUENCIES

SURFACE CURRENTS

Data Presentation

The following legend shows two types of surface current presentations by 1° quadrangle, type 1 with 12 or more observations and type 2 with fewer than 12 observations. Where there are 11 or fewer observations within a 1° quadrangle, the total number of observations is shown within the 90° quadrant containing the observations.



A Number of calms (included in total observations).

B Total observations

C Mean speed (0.8 knot) for all observations.

D Vector resultant direction (°T) for all observations.

E Percent frequencies (57% primary direction, 23% secondary direction).

F Mean speeds (1.0 knot primary direction, 0.6 knot secondary direction).

G Number of observations by quadrant.

Type 1 - If there are 12 or more non-calm observations in a 1° quadrangle, the surface current is depicted by vector resultants as follows:

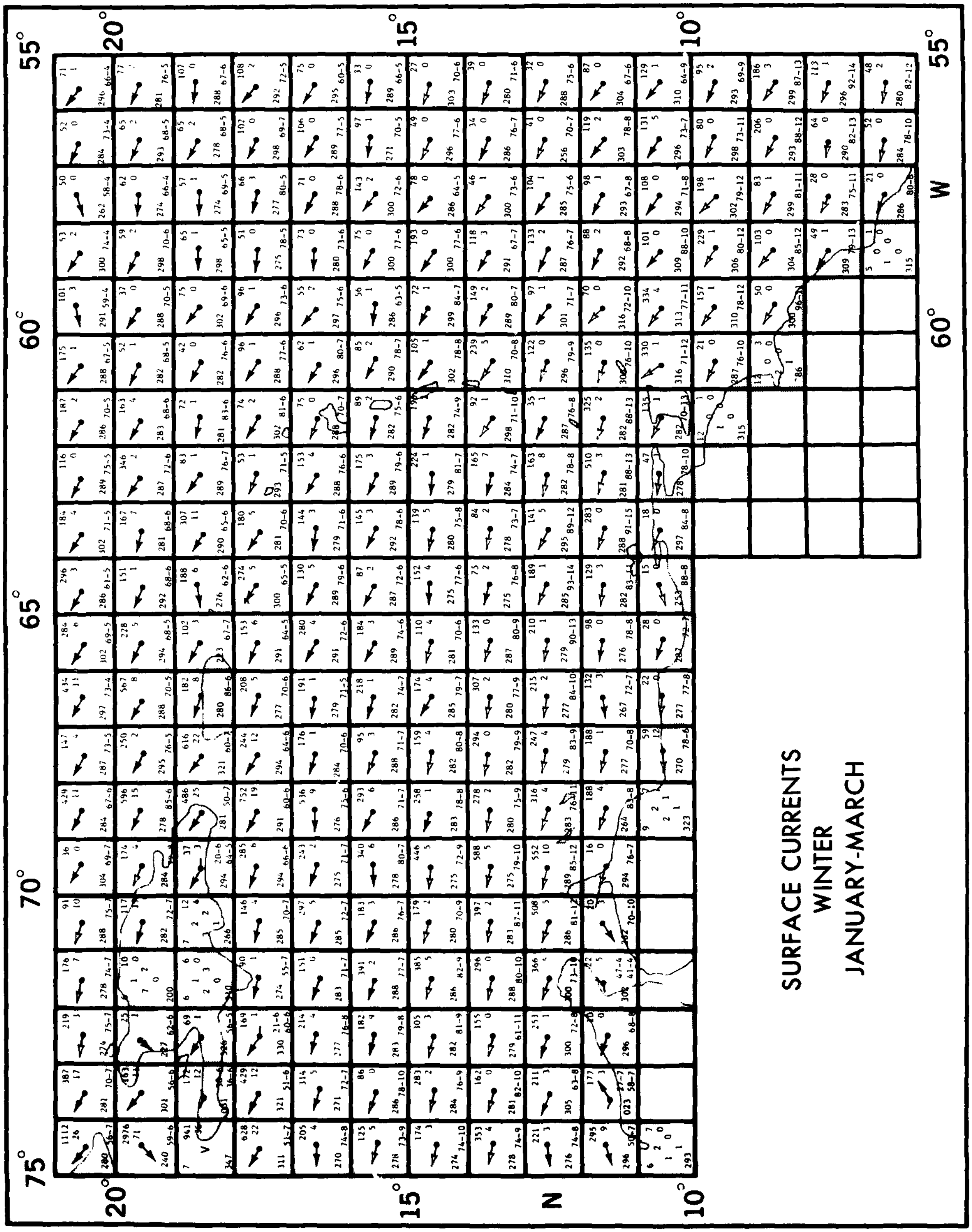
Persistent Current - 60 percent or more of all observations fall within a 45° sector of the 8-point compass.

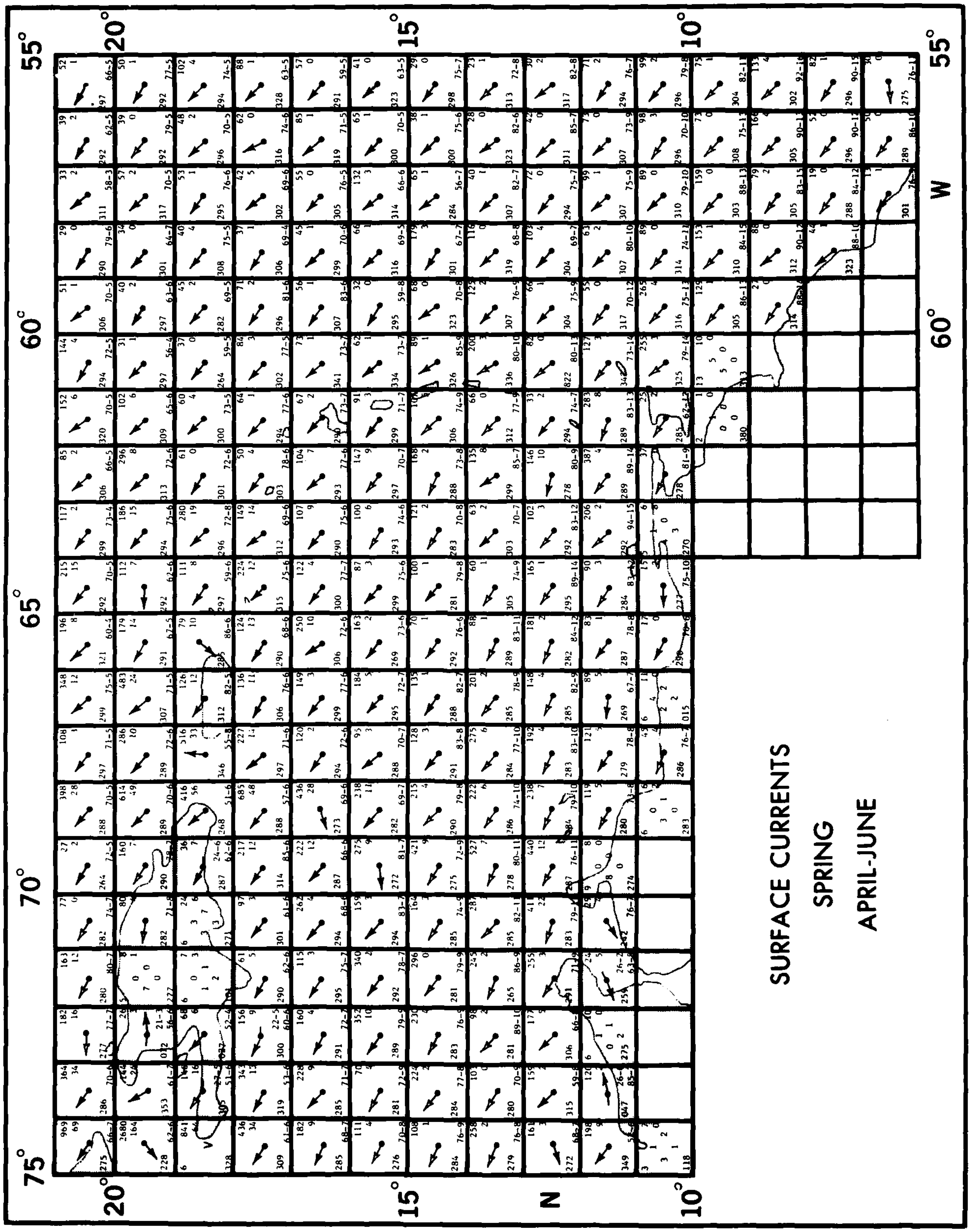
Primary Current with Secondary Direction -
Primary Current - 50 percent or more of all observations fall within three adjacent 45° sectors.
Secondary Direction - 20 percent or more of all observations fall within a 45° sector, and the two resultant vector directions are separated by more than 90° of arc.

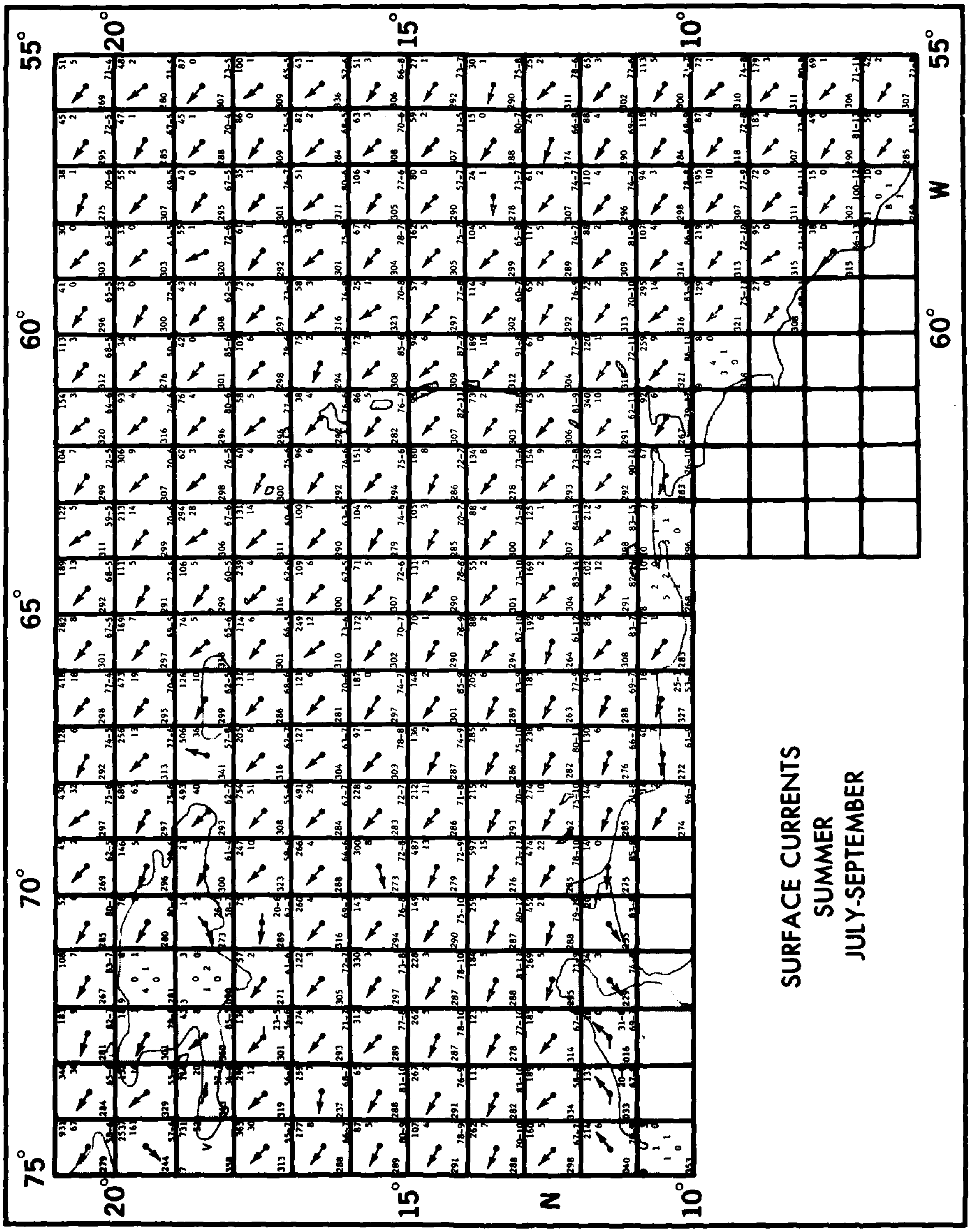
Prevailing Current - 70 percent or more of all observations fall within two adjacent 45° sectors.

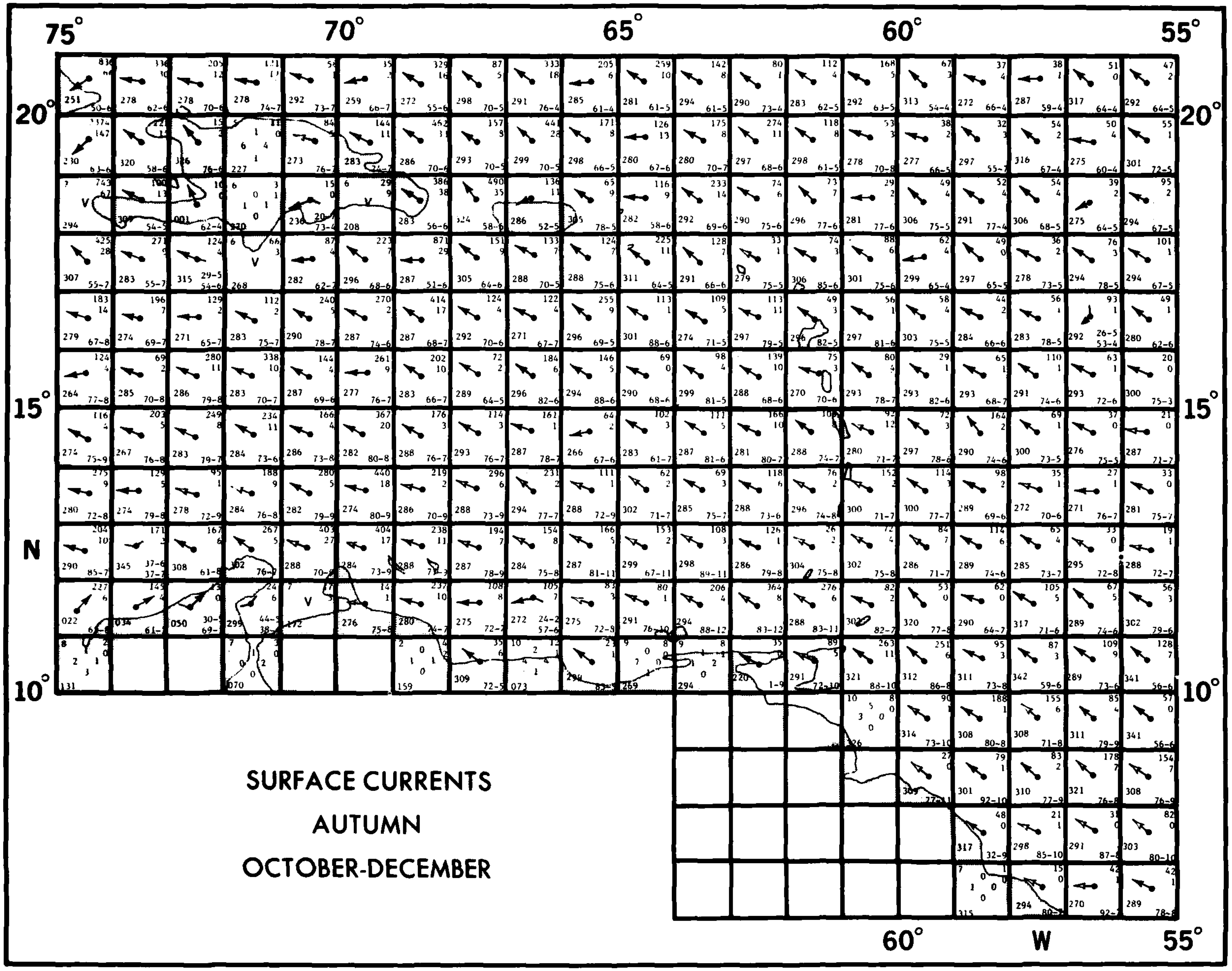
Bizonal Flow - Practically all observations are concentrated in opposite pairs of 45° sectors, and one pair contains at least 80 percent as many observations as the opposite pair. This generally indicates variability that occurs in zones of entrainment between opposing currents.

V Variable Current - The 45° sector with most observations has less than 25 percent of all observations; direction is indeterminate.


SURFACE CURRENTS
WINTER
JANUARY-MARCH
55°
60°
65°
70°
75°
20°
15°
10°
N
W


SURFACE CURRENTS
SPRING
APRIL-JUNE
55°
60°
65°
70°
75°
20°
15°
10°
N
W


SURFACE CURRENTS
SUMMER
JULY-SEPTEMBER
75°
70°
65°
60°
55°
20°
15°
10°
N
W


75°
70°
65°
60°
55°
20°
15°
10°
N
W
SURFACE CURRENTS
AUTUMN
OCTOBER-DECEMBER

END

DATE

FILMED

10-86